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THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—9TH YEAR. SYDNEY: SATURDAY, JUNE 17, 1922. No. 24.

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SOME OPERATIONS ON THE ROUND LIGAMENTS AND THEIR DANGERS.[1]

BY H. A. POWELL, C.M.G., M.B., CH.B.,

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THREE years ago Mrs. R. had a Gilliam operation performed in Beatrice Ward of the Adelaide Hospital and she made an uneventful recovery and her condition was apparently much improved by the altered position of her uterus. At times, however, she had attacks of pain in the abdomen resembling intestinal colic, sometimes lasting an hour or two. One morning about a month ago she was suddenly prostrated by very acute abdominal pain, followed by vomiting and signs of severe shock. Late in the afternoon she was admitted to Beatrice Ward and I saw her there shortly afterwards. She was evidently desperately ill; her face was drawn and pale; her knees were drawn up and all her abdominal muscles were rigid and board-like. There was impaired resonance in the lower third of the abdomen and *per vaginam* the uterus could be felt surrounded by an indefinite mass, more pronounced in the left fornix, feeling soft and boggy to the examining finger.

She was anæsthetized and an incision made in the mid-line mostly above the site of the scar of the previous operation. The aponeurosis was seen to be dimpled on either side of the mid-line, indicating the attachment of the loops of the round ligament. When the peritoneum was opened, there was an immediate protrusion of distended coils of small intestine, quite black in colour; with the intestine there was an escape of offensive smelling fluid. Examination revealed the fact that about 230 to 240 centimetres of the small intestine had passed through a small hole in the broad ligament in the angle formed by the attachment of the round ligament to the aponeurosis and had become strangulated. The greater part of the affected intestine had then passed again into the general abdominal cavity over the front of the uterus, but a small coil had become packed into the space to the left of the uterus and below the round ligament. I divided the right round ligament and freed the intestine and then removed the gangrenous mass of intestine and mesentery. After repairing the rent and uniting the divided ends of the round ligament, I closed the abdominal wound, leaving the divided ends of the small intestine outside of the wound for subsequent treatment, if the patient survived. There was slight improvement in the condition of the

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 30, 1922.

woman for a couple of days, but she died on the fourth day after the operation from septic absorption and peritonitis.

Several years ago a patient of mine was sent from the country to consult an Adelaide gynæcologist and was operated upon for retroflexion of the uterus. An attempt was made to shorten the round ligaments by the Alexander-Adams operation, but the right ligament gave way when a strain was put upon it and the abdomen had to be opened and the uterus supported by ventro-fixation.

These cases I describe as an excuse to bring to your notice some of the dangers and risks of operations upon the round ligaments and, although I may not be able to tell you anything new, I may perhaps help you in your choice of an operation for improving the position of the uterus and emphasize the precautions necessary to escape some of the risks.

Deaver describes the round ligaments as being composed of muscular and connective tissue forming bands that arise on either side of the body of the uterus below and in front of the Fallopian tubes. They then pass upwards and outwards and slightly backwards to the internal opening of the inguinal canals, crossing the outer border of the deep epigastric vessels on the way to the canal, where they are reinforced by small muscular bands corresponding to the cremaster muscles in the male. The ligament is usually much thicker and stronger in its internal half than in the half near to and in the canal. This fact has to be remembered in considering the choice of operation. The length of the ligament and the looseness of its connexions serve to show that its action is more one of restraint of excessive movement of the uterus than of fixing the organ in a normal position.

In considering the advisability of any operation involving the shortening of the round ligaments, it is well to remember the action of the utero-sacral ligaments, for a relatively fixed retroposition of the cervix adds greatly to the utility of any operation designed to relieve a backward position of the uterus. Dudley says:

> There is, perhaps, more scientific indication for shortening the utero-sacral than for shortening the round ligaments, because these ligaments should maintain the normal short distance between the *cervix uteri* and the hollow of the sacrum and because shortening them therefore may fulfil an essential indication; but shortened utero-sacral ligaments do not hold well and the operation is not satisfactory.

It is also well to notice if the cervix is held more than naturally forwards by a short anterior vaginal wall and similarly shortened utero-vesical ligaments. If such a condition exists and is marked, it is easily remedied by a transverse incision in the vaginal wall just in front of its junction with the cervix, by a wide separation of the bladder from the supravaginal cervix and by suturing the wound so as to make an antero-posterior linear scar.

I now come to the choice of method in shortening the ligaments. There are very many operations for this purpose, the very number of them seeming to suggest the risks, the dangers or the ultimate unsatisfactory results obtained from the majority of them.

The ligament may be shortened by a pull through the inguinal canal without opening the abdomen, as in the Alexander-Adams operation, or with an opening into the abdominal cavity through the peritoneal cuff, so that the pelvic cavity and its contents might be examined and adhesions broken down (Goldspohn).

There are many modifications of these operations introduced by Newman, Abbe, Fry, Blake, Cleveland and others, but all of them have but a limited usefulness, because they can only be performed when the uterus is small, when there is only a mild degree of retro-displacement and when there are few or no adhesions.

The other chief objections to these methods of shortening the round ligaments are:

(*a*) They do not permit of a thorough examination of the pelvis.

(*b*) The direction of pull is chiefly laterally and not forward.

(*c*) There is danger of hernia in the pulled-out cuff of peritoneum covering the round ligament.

(*d*) Occasionally there is difficulty in picking up the ligament in the canal.

(*e*) The ligament has been known to break when considerable strain has been put upon it.

Even in 1910 it was said: "Perhaps we may drop the curtain on Alexander's operation, now regarded as obsolete." But that is rather sweeping, for a condition is occasionally seen that could be treated quite satisfactorily by this operation or by one of its modifications.

Figueroa, of Mexico, in 1913 devised an operation for moving the exit of the ligament towards the median line, so that the shortened ligaments thus give a forward pull.

Intra-Abdominal Shortening of Round Ligaments.

In these operations the round ligament is folded upon itself in various ways, either by simple plication, by attaching the folded ligament to the abdominal wall or by suturing it to the body of the uterus. The best-known of these is that of Baldy, or Baldy-Webster, in which the folded or divided ligament is brought through the broad ligament and sutured to the posterior wall of the *fundus uteri*. A later modification of this operation is that of Bagley, who draws the folded ligaments through the broad ligament and then under the peritoneum covering the posterior wall of the fundus and joins them in the mid-line.

In doing the last mentioned methods (Baldy and modifications) it is necessary to take care to attach the ligament close to the upper border of the fundus or, rather, near enough to prevent the shortened ligaments forming a band over which the fundus tips into a position of retroflexion.

The chief objections to these methods of shortening the round ligaments are that the outer weakest portion of the ligament is utilized and that the pull is made in a lateral direction and does not

overcome the marked backward tendency noticed in many cases.

Transplantation of Round Ligaments into Abdominal Wall.

Among the earliest to advocate one method of utilizing the round ligaments in this way was Gilliam, who in 1900 described an operation of drawing the uncut ligament through a stab wound of the abdominal wall about 2.5 centimetres outside the median skin incision and sewing it to the outer surface of the aponeurosis. This method was and still is very extensively practised, but the chief objection, that it left two free bands in the abdominal cavity and so brought about the risk of strangulation of the intestines, is according to some authorities a very strong one. Another risk is that of drawing the uterus too close to the abdominal wall when the cervix is anteriorly placed and so leaving little space for bladder expansion.

Later methods of transplanting the round ligaments aim at doing away with the risks attendant upon leaving free bands in the abdominal cavity and at the same time utilizing the strong inner half of the ligament for the support of the uterus. The outer free part of the ligament was sewn to the abdominal wall; Crossen and others described methods of drawing it through a small puncture in the abdominal wall close to the internal abdominal ring or through the ring itself.

Crossen in 1917 described his method as follows:

> Ligament brought out through peritoneum close to the internal inguinal ring (about an inch median to it), then along in the subperitoneal tissue to the rectus, out through the rectus muscle and fastened to under surface of anterior rectus sheath. The work is most conveniently carried out by means of a special puncturing tenaculum forceps, which enters at the median incision just below the outer sheath of rectus muscle, passes obliquely through rectus muscle into subperitoneal space and then along in the subperitoneal space to near the internal inguinal ring. Here it punctures the peritoneum, grasps the round ligament one and a half inches from the uterus and brings it out along the forceps track.

Several minor modifications of this operation have been described. One that is possibly an advantage, is to pass a catgut ligature under the ligament instead of seizing it with the tenaculum forceps so as to avoid as much as possible any interference with its nutrition.

If the ligaments are very long, I sometimes join the loops across the median line instead of securing them to the aponeurosis.

John Craig last year described a method for which he claims almost ideal results. The abdomen is opened just above the pubis a little on either side of the mid-line. At a point on the external surface of the abdominal wall, about five centimetres from the edge of the wound and a little above the pubis, a ligature carrier of forceps pattern, armed with stout silk, is made to penetrate. When through the wall, the blades are separated a little to widen the aperture made; the carrier is then passed around the round ligament about three centimetres from the uterus. Both ends of the silk are now grasped by the carrier and withdrawn through the aperture at which they entered, taking the silk, which, being pulled upon, brings out a loop of the round ligament. The process is repeated on the other side and the uterus will be found to occupy the normal position.

The next step is to dissect up a strip of the aponeurosis parellel to its fibres and at the edge of the aperture made; this strip must be about six millimetres wide and of sufficient length to be passed easily under the loop of the round ligament and stitched back in its bed with interrupted sutures. With this method the entire length of the ligament is still of use, should the uterus become pregnant.

Risks and Difficulties.

Such are samples of the operations most commonly performed on the round ligament for the purpose of rectifying certain displacements of the uterus. Before determining which offers the greatest measure of success, it would be well to examine some of the difficulties and risks encountered.

In extra-peritoneal operations there is, firstly, the difficulty of finding the ligament and this, in some cases, is a very real one. When found and properly isolated, there is sometimes considerable difficulty in drawing it out sufficiently to bring the uterus forward; occasionally (as in the case quoted) the ligament may break, either in the canal or nearer to the uterus.

One of the risks of this operation is that adhesions that are not detected, might be broken and give rise to troublesome hæmorrhage.

The chief disadvantages of these operations are the lateral pull given to the uterus and the fact that they do not permit a proper examination of the pelvis.

In the operations in which a loop of the round ligament is drawn through the broad ligament, there is always a risk of subsequent hernia; the pull on the uterus is lateral and the weak, outer portion of the ligament is utilized to stand the strain.

Operations that, like Gilliam's, leave free bands in the peritoneal cavity, are always open to the objection that there is grave risk of subsequent hernia and strangulation. Although many operators give long lists of such operations without any mishaps, it is only reasonable to prefer other methods which do not leave the loops or free bands in the peritoneal cavity.

Operations that aim at a subperitoneal transplantation of the ligament are usually rather more difficult to perform, especially when the pull is made in a forward direction, than others which offer results quite as good.

In all operations in which it is necessary to perforate the parietal peritoneum, care should be taken that the loop, when drawn out completely, fills the hole made. In making the perforations the surgeon should try to avoid wounding vessels in the abdominal wall (such as the deep epigastrics).

Care must be taken that the uterus is not pulled too far forwards, especially when the cervix is also fixed in a more forward position than usual and, as a result, the space for bladder expansion is cramped, thus giving rise to bladder irritation, with frequency of micturition and its discomforts.

In drawing up the uterus, we must also think of the possibility of future pregnancy and allow suf-

ficient mobility of the organ to counteract any tendency to miscarriage.

Having given due consideration to the risks and difficulties of the operative procedures practised on the round ligaments and having seen that the cervix is not placed too far forward, we are now in a position to make choice of method that promises the best results.

It appears to me that we should choose the one that conforms most closely to the following considerations. The operation should:

(*i.*) Allow a thorough examination of the pelvis.
(*ii.*) Utilize the strong inner half (or more) of the round ligament.
(*iii.*) Leave no free band in the peritoneal cavity.
(*iv.*) Leave no weak spot in the broad ligament as a possible path for hernia.
(*v.*) Exercise a partially forward pull on the uterus.
(*vi.*) Allow for the future possibility of pregnancy.
(*vii.*) Allow sufficient space for normal expansion of the bladder.

THE WASSERMANN REACTION AS AN INDEX OF CURE, WITH SPECIAL REFERENCE TO THE VALUE OF COLD FIXATION IN THE TECHNIQUE OF THE TEST.[1]

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THE most difficult problem in connexion with the treatment of syphilis is to determine when the patient may be regarded as cured of his infection. In the treatment of disease the clinician depends mainly upon two factors to aid him in deciding when he may reasonably regard a cure as having been effected, *viz.*, the disappearance of signs and symptoms indicative of the disease and judgement based on past experience. Of recent years, increasing prominence has been given to a third factor which is frequently of help in this direction, *viz.*, the use of laboratory tests.

One of the characteristics of syphilis is an absence throughout the greater part of its course and more particularly when the patient is undergoing treatment of any obvious manifestations. On the other hand, certain lesions may remain and may even advance after the patient has been treated to the extent of being regarded as cured of his infection, as, for example, aneurysm. As an indication of cure, then, observation of physical signs in syphilis offers little help.

In considering the extent to which judgement can be relied on to indicate that a cure has been effected, it is necessary to refer to the possible course of events in any syphilitic infection. For a short and indefinite time after inoculation the organism remains localized, being shut off by a wall of inflammatory tissue, the outward and visible sign of which is the chancre. In course of time, depending on the amount of local response, the protective wall is broken through and generalization occurs, the spirochætes rapidly becoming disseminated throughout the body by way of the blood and lymph streams. In their passage through the minute vessels many of the organisms pass through the thin walls and enter the adjacent tissues. They are doubtless able to penetrate to a certain extent, owing to their intrinsic power of movement, and we may suppose that they come to rest and multiply at varying distances from the vessel walls. Wherever this occurs a reactionary process is set up, one result of which is the production of antibodies inimical to the invading organism. The subsequent fate of the spirochætes would then seem to depend on two factors: Firstly, the strength and rapidity of mobilization of the defensive forces of the body, *i.e.*, the rate at which antibody formation proceeds, and, secondly, the blood supply to the affected part, the more vascular the organ, the greater the stream of antibody with which the organisms have to contend. In parts of the body the presence of the spirochæte and the accompanying reaction are evidenced either by obvious lesions, as, for example, the skin rash of secondary syphilis, or by symptoms pointing to the part involved, as, for example, the persistent headache, vertigo, etc., which accompanies infection of the meninges. In other parts, invasion may be asymptomatic, as, for example, in the walls of blood vessels and in parts of the central nervous system. In the latter situation conditions favour the survival of the organism, owing to the relatively non-vascular nature of the tissue and to the fact that local production of antibody in the intra-thecal system is very limited.(1)

Further, as a result of the local reaction, the organism gains an additional line of defence through becoming walled in by a zone of inflammatory tissue and so removed still further from the blood supply. So situated it is in a strategic position to resist treatment when this is commenced and, being snugly entrenched, may remain, unharmed in spite of the most assiduous treatment, as a persistent but unsuspected focus. As most patients seek advice only when generalization of the disease has occurred, it is apparent that the judgement of the most experienced observer may be at fault, if relied on to indicate when cure has occurred.

The probable presence of such unsuspected, but often persistent foci is of importance in considering the significance of the third factor, *i.e.*, the laboratory test, as being a possible source of help in the determination of cure. Probably no other laboratory test has met with so much criticism as has the complement deviation test applied by Wassermann to the diagnosis of syphilis. The exact nature of the reaction is still a matter on which opinions are divided, but, in spite of this, it is universally agreed that, so long as certain general principles affecting the technique are adhered to, the test holds a position as a diagnostic agent of unassailable value. Of recent years considerable prominence has been given to the possibilities of utilizing this test as a guide to the response to treatment or as an index of cure. In the absence of other criteria in this respect, there is a danger of conceding to the test a significance

[1] Read at a meeting of the Western Australian Branch of the British Medical Association on April 19, 1922.

out of all keeping with its probable value. The significance to be attributed to the negative result, occurring as a result of treatment, is difficult to determine, because as yet the exact nature of the reaction is not thoroughly understood. The modern treatment of syphilis appears to have resolved itself into a frenzied effort to obtain a "negative Wassermann," which, to many, would appear to represent the signal to cease treatment and to regard the patient as cured.

If we are to accept the test as affording an indication of cure, it is necessary to have some conception of what a failure to react may imply.

The most workable theory and one very generally accepted to explain the positive response in the reaction with a syphilitic serum is that it indicates the presence of a substance, known as "Wassermann substance," which occurs as a by-product of the process of disintegration resulting from the fight between spirochætes and body tissues. A positive Wassermann reaction would then denote (*a*) living spirochætes and (*b*) cell reaction. Accepting this hypothesis, we could expect a negative result with the serum of syphilitic persons under the following conditions:

(1) In the early stages of infection, before the defensive forces of the body have been fully mobilized to meet the invading organism. This explains the negative result met with in the early primary stage.

(2) When the invading organisms are overwhelming in their action and the body is apparently unable to marshal its defensive forces, as, for example, in malignant syphilis.

(3) In untreated syphilis if the defensive elements of the body have gained the ascendancy to an extent sufficient to render the spirochæte temporarily *hors de combat*. This condition must occur rarely; but it may explain those cases of latent syphilis in which a reaction becomes manifest only after a provocative injection with an arsenical compound.

(4) In treated syphilis when by the aid of medication the same condition results, *i.e.*, the spirochæte, though not necessarily eradicated, is temporarily overcome and becomes quiescent.

It is obvious then that a negative result obtained during treatment or soon after the cessation of treatment does not necessarily indicate freedom from disease.

At a conference recently held in Melbourne[2] to consider certain problems affecting venereal disease, it was recommended that after a definite course of treatment had been carried out and in the absence of manifestations of disease the minimum requirement for a standard of cure should be that the "negative Wassermann" obtained after cessation of treatment be sustained throughout the succeeding period of twelve months. In this recommendation, beyond the statement that the test should be done in an approved laboratory, no mention is made of the technique to be adopted in carrying out the test.

On theoretical grounds it is possible for serum to be devoid of power to fix complement for twelve months or even longer after treatment has ceased, even though the patient be not cured. If an unsuspected and quiescent focus of infection remain, it may cause insufficient tissue reaction for any immediate change to be detected by the serum test. It is reasonable to assume, however, that in many cases the presence of such a focus will eventually become manifested by a further change in the Wassermann test. The spirochæte, even quiescent, is a foreign body and is a living organism absorbing nourishment from its host. In order to maintain its existence a certain amount of activity is necessary and the presence of the organism probably constantly causes a degree of reaction in the tissues. Though insufficient to produce clinical evidence, such activity would become manifest in course of time by a gradual return of the power to react. A modification recently introduced in the technique of the test affecting the time and temperature of contact during the fixation stage, known as the ice-box modification, enables this return to be detected much earlier than when the ordinary technique is used. The increased sensitiveness thus obtained is also apparent in tests with the serum of patients undergoing treatment, the original power to react persisting for a much longer period by the ice-box method than by the ordinary method.

This theoretical consideration of the possible return of the positive reaction with sera which given a negative for a few months after treatment has ceased, is substantiated by the following results.

In twelve cases in which treatment had been continued for at least two years, the treatment consisting of several intravenous injections of arsenic and the continuous application of mercury, a "negative" reaction was obtained from two to four weeks after all treatment had ceased. In ten of these "Wassermann" remained negative for periods ranging from twelve to eighteen months after this without any more treatment. In two cases no subsequent test was carried out during the twelve months succeeding the cessation of treatment. These tests were made before the introduction of the ice-box method of technique. Quite recently I was enabled to retest the serum of these patients with the following result:

(*a*) Re-testing by ice-box technique. In two the reaction remained negative; in one there was a doubtful positive reaction; in one a strong, incomplete positive reaction was obtained and in eight there was a complete positive reaction.

(*b*) Re-testing by the older method the results were as follow: Seven were negative; a complete positive reaction was obtained in two and an incomplete reaction in three.

Evidence that this return of the power of the serum to react was associated with a continuance of the infection was forthcoming in four of the patients. Two had developed a syphilitic osteitis; one developed a syphilitic dermatitis; the fourth was sufficiently interesting for me to give his history. In this case a series of negative results was obtained by the old method over a period of two years after the cessation of a long period of treatment. In view of this the patient was allowed to marry. Some three or four months after marriage his wife became pregnant and shortly afterwards developed a secondary rash and throat and her serum yielded a positive reaction. The husband's blood was then re-

tested and it was found that his serum had regained the power to react, though no obvious evidence of infection was present. The probable explanation in this case is that an unsuspected focus remained in the testicle, giving rise to a case of conceptional infection.

The actual number of cases in this series is small, but it must be remembered that it is difficult to get hold of patients once they have ceased treatment. One or two came to me voluntarily, as they wished to get married and were anxious to know if they were "still free from infection." For the opportunity of re-testing the others, I am indebted mainly to Dr. H. J. Gray.

In almost all of the cases the tests were carried out by me. One or two of the earlier tests were done in Melbourne.

Though small in number, the series is rather illuminating, since by the more sensitive method 80% showed a subsequent return of the positive reaction after giving a sustained negative for twelve months, the negative results in these cases being obtained by the older method of technique.

In view of these results I suggest that if the "negative" results are to be given "official" recognition as a guide in issuing certificates of cure, such result should be obtained only by the more sensitive method of technique, *i.e.*, the ice-box modification. The period during which the negative must be sustained should be extended, if practicable, to three years after all treatment has ceased, the patient being given a sort of "ticket of leave" exemption, under which he should be compelled to report at intervals of six months for blood-testing purposes. At the end of three years, a sustained negative would then indicate a strong probability of cure; but this defines its limits in this direction.

Ice-Box Modification.

Reference has been made to the increased sensitiveness afforded by the use of a modified technique in which the main feature of modification is that the fixation stage is carried out for a prolonged period at the temperature of the ice-chest (6° C. to 8° C.). This is exemplified in the cases already quoted, which, on being re-tested, showed a considerably higher proportion of positive results by the ice-box technique than by the older method of rapid fixation at 37° C.. A review of these results raises the question whether the method is not supersensitive and so likely to be productive of false results. As a check on this, I have compared the results in a series of five hundred cases of which full clinical notes were obtained. Parallel tests were put up with each serum, the two methods of technique being used, one embodying the principle of ice-box fixation for eighteen hours, the other fixation at room temperature for half an hour, followed by the water bath at 37° C. for half an hour. The technique used in the former was that advocated by Griffiths and Scott;[3] in the latter the technique followed was that detailed in the British Research Committee's Report[4] (1918) as the "Number 4 Method."

The cases may be grouped as follows:

(1) Cases for diagnosis.
(2) Cases of syphilis in patients who had been under treatment for varying periods, but in whom treatment had ceased for at least ten days prior to the test being performed.
(3) Cases of syphilis in patients under treatment at the time of testing.

(1) Cases for Diagnosis.

The total number examined was 243. These are divided into the following sub-groups:

(*a*) Suspected primary syphilis (untreated), twenty-five patients.
(*b*) Secondary syphilis (untreated), thirty-two patients.
(*c*) Tertiary syphilis (untreated), forty-two patients.
(*d*) Congenital syphilis, one patient.
(*e*) Doubful infections, one hundred and forty-three patients.

(a) Suspected Primary Syphilis (Untreated).

The serum of twenty-five patients with penile sores was examined. Ten of these gave a complete positive reaction and one gave an almost complete positive result by each method. The earliest positive result was obtained thirty-seven days after infection in a case of intra-urethral chancre. Eleven gave a negative result by each method. Three gave divergent results as follows:

TABLE I.[1]

Case Number.	Ice-Box Method.		No. 4 Method.		Lesion.
	Row 1.	Row 2.	Row 1.	Row 2.	
360	0	0	Tr.	++	Penile sore (? duration)
407	Tr.	Tr.	Tr.	C	Penile sore three weeks
629	0	0	?C	C	Penile sore, indurated glands in groin

[1] The notation used is that suggested by Griffiths and Scott, the results being read after sedimentation of corpuscles.

0 = No hæmolysis.
?Tr. = Faint tinting only of the supernatant fluid with hæmoglobin.
Tr. = Slight but definite tinting of the supernatant fluid with hæmoglobin.
C = Complete hæmolysis.
?C = Almost complete lysis, but the fluid not perfectly clear on shaking.
+ = Approximately one-fifth of the cells lysed.
++ = Approximately two-fifths of the cells lysed.
+++ = Approximately three-fifths of the cells lysed.
++++ = Approximately four-fifths of the cells lysed.

(b) Secondary Syphilis (Untreated).

Thirty-two patients presenting undoubted evidence of secondary syphilis were examined. Of these, twenty-nine gave a complete positive result by each method. Three gave divergent results as follows:

TABLE II..

Case Number.	Ice-Box Method.		No. 4 Method.		Lesion.
	Row 1.	Row 2.	Row 1.	Row 2.	
232	0	0	? Tr.	? Tr.	Mucous patches on both tonsils and pharynx
378	0	0	+	? C	Secondary lesions in throat; healed sore
582	0	0	0	? Tr.	Secondary rash

(c) Tertiary Syphilis (Untreated or Treated for Few Weeks Only at Time of Infection).

Forty-two patients giving a history of syphilis and exhibiting tertiary lesions were examined. Of these, thirty-nine gave a complete positive reaction by each method. The remaining three gave the following results:

TABLE III..

Case Number.	Ice-Box Method.		No. 4 Method.		Lesion.
	Row 1.	Row 2.	Row 1.	Row 2.	
419	0	0	0	? Tr.	Paralysis of arm and leg for three years
525	0	0	0	Tr.	Nodular liver
586	0	0	Tr.	+	Specific ulcer on leg

(d) Congenital Syphilis.

Only one patient with congenital syphilis was included in the series. This was a baby nine weeks old whose serum was completely positive by each method.

(e) Doubtful Infections.

The patients in this group numbered 143. The serum of nine yielded some evidence of positivity by one or other method, the remaining 134 being negative by each method.

The results obtained with the serum of nine which reacted, are set out hereunder. These patients might reasonably be regarded as syphilitic, but the history of infection was not clear at the time of testing.

TABLE IV..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
106	++	++++	C	C	Intractable dermatitis; husband has syphilis
113	++++	? C	C	C	Primary chancre thirty-two years ago; five weeks' treatment at time; now has headache and lightning pains
146	0	+	C	C	History of syphilis thirty years ago; now has a high blood pressure and possibly aneurysm
221	Tr.	Tr.	C	C	Vitreous opacity; has been under treatment for a short time
333	++	+++	C	C	Syphilitic lung; admits risk of infection
387	++++	++++	C	C	Husband had syphilis some years ago
411	++	++	C	C	Incontinence of urine and ataxy
451	+	++	+++	C	Has high blood pressure; was previously told he had syphilis
631	0	0	C	C	Papular dermatitis

Of the one hundred and thirty-four patients whose serum was negative by each method, some from the clinical features and history were thought to be syphilitic, as, for example, the following:

Case Number.	History.
84	Laryngitis and inter-arytenoid thickening; history of soft chancre in 1915. Wassermann negative. Condition cleared up with rest and general treatment.
121	Male, aged forty. History of many attacks of gonorrhœa; nasal obstruction due to swelling in naso-pharynx. Wassermann negative. Portion of swelling removed and examined microscopically; found to be endotheliomatous.
313	Patient has Argyll-Robertson pupil and gastric crises. Wassermann negative. Cerebro-spinal fluid not examined.
345	Rombergism; left eye showed Argyll-Robertson pupil. Left knee-jerk was absent. Wassermann negative. Cerebro-spinal fluid not examined.
347	Sore throat one month, with ulceration of fauces. Wassermann negative. Provocative injection of galyl was given; Wassermann negative. Smear from throat then examined and showed numerous tubercle bacilli.
495	Sore throat one month, with huge septic tonsils; history of gonorrhœa and balanitis some weeks previously. Wassermann negative. Tonsils removed; condition cleared up.
515	Rombergism; knee-jerks were sluggish. Wassermann negative. Cerebro-spinal fluid was not examined.
635	Intertitial keratitis. Wassermann negative.
714	Enlarged liver and tremor of hands. Wassermann negative.
726	Male, aged fifty. Membranous exudate involving the buccal mucous membrane and palate of some few months' duration; condition extending. Wassermann negative. Subsequent development of acute pemphigus of skin; confirmed diagnosis of pemphigus of mouth.

(2) Patients Treated for Varying Periods in which Treatment had Ceased at least Ten Days Prior to Test Being Done.

The total number examined was 114. These are divided into the following:

(*a*) Patients treated for two years or longer and the treatment had ceased more than one year prior to the test being made.

(*b*) Patients treated for two years or longer and the treatment had ceased less than one year prior to the test being made.

(*c*) Patients treated for less than two years and the treatment had ceased more than one year prior to the test being made.

(*d*) Patients treated for less than two years and the treatment had ceased less than one year prior to the test being made.

(a) Patients Treated for Two Years or Longer and the Treatment Had Ceased More Than One Year Prior to the Test Being Made.

This group comprised thirty-one patients. A positive reaction was obtained by each method with the serum of five; a negative result was obtained by each method in thirteen; divergent results were obtained with the serum of twelve. The histories of these patients and the results of testing are as shown:

TABLE V..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
43	0	0	++++	++++	Two years' treatment; ceased three years ago; infection nine years ago
163	Tr.	+	+	++	Three years' treatment; ceased fourteen years ago; now has suspicious rash
214	0	0	C	C	Two years' treatment; ceased eight years ago
224	0	0	C	C	Two years' treatment; ceased ten years ago; now has tabes
296	Tr.	++	C	C	Several years' treatment; ceased eight years ago; now skin eruption and repeated miscarriages
334	+	+++	C	C	Prolonged treatment thirty years ago
400	+	+	C	C	Prolonged treatment; ceased many years ago; now has dermatitis
483	++	++	C	C	Two years' treatment; ceased one year ago
573	0	0	+++	? C	Several years' treatment; ceased five years ago; pronounced cured
666	0	0	C	C	Two years' treatment; ceased twenty-five years ago
681	++	+++	C	C	Two years' treatment; ceased one year ago
718	++++	? C	C	C	Two years' treatment; ceased one year ago

(b) Patients Treated for Two Years or More and the Treatment Had Ceased Less Than One Year Prior to the Test Being Made.

There were twenty-six patients in this group. The serum of eight yielded a positive reaction, while that of nine gave a negative by each method. Divergent results were obtained in nine. The histories of these and results of testing are as shown:

TABLE VI..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
77	0	0	? 0	? Tr.	Two years' treatment; ceased one month ago
109	0	Tr.	C	C	Two years' treatment; ceased one month ago; treatment commenced in tertiary stage
130	? Tr.	Tr.	++	? C	Two years' treatment; ceased two weeks ago; treatment commenced in secondary stage
216	0	0	Tr.	? C	Two and a half years' treatment; ceased six weeks ago
288	0	0	Tr.	++++	Three years' treatment; ceased one month ago
321	++	+++	? C	C	Two years' treatment; ceased three months ago
335	++++	++++	C	C	Two years' treatment; ceased three months; primary lesion four years ago; treatment commenced in secondary stage
385	+++	+++	C	C	Two years' treatment; ceased ten days ago
401	0	0	0	+	Three years' treatment; ceased six months ago

Treatment in these cases consisted of regular courses of an arsenical compound, usually galyl, administered intravenously, as well as a continuous course of mercury and iodides by the mouth. A few patients had intra-muscular injections of mercury in addition.

(c) Patients Treated for Less Than Two Years and the Treatment Had Ceased More Than One Year Prior to the Test Being Made.

There were eighteen patients in this series. The serum of seven yielded a positive reaction; that of three a negative by each method. The history of these three patients raises considerable doubt as to whether the patients had had syphilis. Divergent results were obtained in eight.

TABLE VII..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
33	Tr.	+	Tr.	+++	Treatment ceased sixteen years ago; had six months' treatment only
46	? Tr.	Tr.	++	+++	Treatment ceased one year ago; had two months' treatment for primary syphilis
299	0	Tr.	C	C	Treatment ceased twenty-seven years ago; had one months' treatment for primary syphilis
300	+++	++++	C	C	Treatment ceased one year ago; treated for six months only; had primary lesion one and a half years ago
308	++++	++++	C	C	Treatment ceased fifteen months ago; treated for tertiary lesions for few months
311	Tr.	+	C	C	Treatment ceased one year ago; had five months' treatment
314	++++	+++	C	C	Treatment ceased eighteen months ago; had few months' treatment with galyl and mercury
329	? Tr.	Tr.	? C	C	Treatment ceased three years ago; one years' treatment for primary syphilis

(d) Patients Treated for Less Than Two years and the Treatment Had Ceased Less Than One Year Prior to the Test Being Made.

This group comprised forty-seven patients. The serum of twenty yielded a positive reaction with both methods, while that of fourteen yielded a negative. Divergent results were obtained in thirteen.

TABLE VIII..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
60	0	0	+	+	Chancre six months ago; treated for three months; ceased ten days ago
134	? Tr.	? Tr.	+++	? C	Secondary syphilis few months ago; treated for six weeks; ceased one month ago
144	0	Tr.	C	C	Secondary syphilis year ago; treated for eleven months with galyl and mercury; ceased one month ago
153	+	++	C	C	Secondary rash eight months ago; treated for four months; ceased one month ago
303	0	0	++++	C	Infection four years ago; treated for two months; ceased one month ago
309	++++	++++	C	C	Treated seventeen years ago for syphilis; fresh treatment commenced six months ago; ceased one month ago
379	0	Tr.	? C	C	Infection seventeen months ago; treated for one year; ceased one month ago
464	0	0	Tr.	C	Two months' treatment; ceased three weeks ago
490	Tr.	Tr.	? C	C	Five months' treatment; ceased two weeks ago
518	0	0	Tr.	+++	Treated two months with galyl only; ceased one month ago
578	0	0	++	? C	Treated for chancre and rash; ceased one month ago
642	0	0	C	C	Short, intensive treatment with galyl and mercury; ceased few weeks ago
664	Tr.	+++	C	C	Six weeks' treatment with arsenic and mercury; ceased two weeks ago

(3) Patients Undergoing Treatment at Time of Testing.

There were 118 of these patients. A positive reaction to the Wassermann test was obtained by each method in fifty-one, while a negative was obtained in forty-eight. Divergent results were obtained in nineteen. I have included as "positive" all those sera which by each method reacted to some degree. The actual number giving a complete or almost complete reaction with each method was thirty-one. Of the remaining twenty the majority gave a complete or almost complete reaction by the ice-box method, but by the older method (No. 4 method) the response was less marked and ranged from one-fifth to four-fifths of the cells lysed in the first row, while in several instances the serum gave complete lysis in the second row. The sera giving divergent results to the extent of appearing positive by one method and negative by the other are shown hereunder:

TABLE IX..

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
176	+++	++++	C	C	Twelve months' treatment with mercury and galyl; secondary rash one year ago
193	+	++	C	C	Under treatment with mercury and galyl
208	Tr.	Tr.	C	C	Four months' treatment with mercury and galyl; secondary syphilis six months ago
221	Tr.	Tr.	C	C	Under treatment with mercury and galyl (also included in Table IV.)
269	+	+++	C	C	Under treatment for eighteen months; primary lesion eighteen months ago
275	+++	C	? C	C	Two years under treatment; secondary rash two years ago

[Continued on next page.

TABLE IX.—*Continued.*

Case Number.	Ice-Box Method.		No. 4 Method.		History.
	Row 1.	Row 2.	Row 1.	Row 2.	
316	++	++++	C	C	Under treatment for past two and a half years
427	++++	++++	C	C	Under treatment for past ten months
532	? Tr.	Tr.	C	C	Under treatment for past three years
571	0	0	? C	? C	Under treatment for past four years
574	0	0	C	C	Has been under treatment for many years
580	0	0	? C	C	Has had three injections of "606" (?); is now taking mercury and iodides
627	0	0	? C	? C	Has had fifteen injections of galyl
648	0	Tr.	? C	C	Has been under treatment for the past three years
656	Tr.	Tr.	? C	C	Has been under treatment for the past two years
659	+	++	C	C	Is under treatment with mercury
674	0	? Tr.	C	C	Two months' treatment with galyl and mercury
676	0	0	C	C	Has been under treatment for several years
683	Tr.	++++	? C	C	Under treatment with galyl, mercury and iodides

This tabulation of results, as given under the various headings, has been considered necessary, because it is of considerable importance in arriving at a conclusion as to the reliability of the ice-box method of technique.

From the results in the first group of cases (cases for diagnosis) it is seen that in primary, active secondary and tertiary syphilis (untreated) the ice-box method is but slightly more sensitive than the older method. Moreover, in one hundred and thirty-four patients (out of a total of two hundred and forty-four in the group) the serum gave a complete negative by either method. In nine cases only (Case No. 629 of Table I. and all cases in Table IV. except No. 451) in which the test was made for diagnostic purposes, was there any actual conflict of results, *i.e.*, positive or partially positive obtained by one method and negative by the other. I have made inquiries from the various medical attendants in charge of these patients whether subsequent events helped to throw any light on the diagnosis.

The patient (Case No. 221) with a vitreous opacity was a prostitute and at the time of testing was in gaol. The medical adviser stated that he had no doubt as to the condition being syphilitic.

The patient (Case No. 333) with syphilis of the lung admitted the risk of infection some years before. He was put on anti-syphilitic treatment and the condition improved wonderfully, while his general health also improved greatly under this treatment. His serum was subsequently tested three times. After four months' treatment the result was almost completely negative by the ice-box technique. Three months later the test by the same method was negative and a few weeks ago the test was still negative, the patient still being under treatment.

The affection of the patient (Case No. 411) with incontinence of urine and ataxy commenced as a peripheral neuritis. The medical attendant told me last week that, in his opinion, the condition is syphilitic.

The rash in Case No. 631, a papular dermatitis, when tested was not a typical secondary lesion. The ice-box result was taken as the more correct and the patient put under anti-syphilitic treatment. In the interval that elapsed between taking the blood for the test and her next appearance at the surgery, an ulcerated condition of the fauces developed. This, together with the rash, entirely disappeared under neo-kharsivan and mercury and a test by the ice-box method repeated after some months' treatment was negative.

The serum in Case No. 387 does not give a sufficiently strong reaction to enable me to give any opinion.

The serum in Case No. 113 is similar, but the story of a previous infection must be borne in mind. I have no further record of the remaining few patients, but the evidence is sufficient in those cases quoted to enable me to infer that the results by the ice-box method were the more correct and that these were not cases of pseudo-positive results.

I mention the other cases quoted under sub-group (*e*) of group (1), *i.e.*, doubtful cases giving a negative result by either method, because it might otherwise appear as if I have set out my results in such a way that the Wassermann test, especially the ice-box modification, affords an infallible guide to the detection of syphilis. These cases will help to remove that impression. In some of these, as, for example, Nos. 121, 347, 495 and 726, the supposed syphilitic lesions were shown later to be due to other causes, but in others there is a strong probability that, in spite of the "negative Wassermann," the patients were syphilitic. An examination of the cerebro-spinal fluid, which, unfortunately I was unable to obtain, would doubtless have helped to clear up some of these.

The next two groups of cases—Groups (2) and (3)—can be reviewed together. They indicate the

value of the ice-box method in the case of patients who have been undergoing treatment. The cases in Table V. are worthy of note as bearing on the significance as an indication of cure of the negative reaction when a considerable interval after treatment has elapsed.

Of the serum of the twelve patients referred to in this table, in which treatment had ceased from one to twenty-five years previously, nine gave a "negative Wassermann" by the old method of technique. Four of these, however, gave a complete positive reaction by the ice-box technique and the remaining five showed varying indications of positivity. It is obvious that when the older method of technique for performing the test is relied on, a "certificate of cure" is liable to be obtained after much less treatment than when the ice-box technique is adopted. This is borne out by the results in the next table (Table VI.), in which the serum of four out of nine patients treated for two years or more gave a negative result with the old method, the test being done within a range of from ten days to three months after cessation of treatment. By the ice-box method an almost complete reaction was obtained once and a partial reaction three times.

The remaining tables (VII., VIII. and IX.) also show that indications of positivity in treated patients are apparent in the test for a considerably longer period when the ice-box technique is adopted.

Summary.

The pathological processes attendant on a spirochætal infection may result in unsuspected foci of infection remaining in spite of the most assiduous treatment. The methods of technique in vogue before the introduction of the ice-box technique are not sufficiently sensitive to indicate in the test result evidence of these clinically quiescent foci. A negative Wassermann test obtained by the older method of technique and sustained even for a considerable time after cessation of a prolonged course of treatment is therefore of doubtful value as an indication of cure.

When the ice-box method of technique is used, indications of positivity are found to persist for a considerably longer period in the case of patients who have been treated than when the older method is used.

The ice-box method, while being more sensitive, is very reliable and, if an approved technique be used, does not produce pseudo-positive results in undiagnosed cases.

Conclusions.

The recommendation of the Melbourne conference on venereal diseases affecting the minimum standard to be adopted in issuing "certificates of cure" in secondary syphilis are not sufficiently comprehensive for the following reasons:

1. The method of technique to be adopted in carrying out the Wassermann test is not designated.

2. The "negative Wassermann" sustained for a period of twelve months, as suggested in the conference recommendation, affords no criterion of cure, even in the absence of manifestations of disease and after a prolonged course of treatment when the test is carried out by the older method of technique. The ice-box modification has not been in use for a sufficient period to justify conclusions being drawn regarding the significance of the sustained negative result obtained by this method. Until more information is available regarding this, it would be advisable to extend the period over which this negative result must be sustained to at least two years and, if practicable, to three years, before issuing certificates of cure.

3. It was suggested that as close an approximation as is practicable to the standards recommended be required by the authorities administering the Acts controlling venereal diseases. The conference may have considered the standards submitted as the minimum necessary, but it must be remembered that in practice the minimum, especially in connexion with large clinics, is apt to become the maximum requirement. The findings of a conference such as that which sat in Melbourne, are likely to be far-reaching and there are doubtless many who will regard the standard suggested as an absolute criterion of cure. It is essential then that the minimum requirement should be as stringent as is reasonably practicable.

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A CONTRIBUTION ON THE MODE OF ACTION OF ATROPINE AND ESERINE ON THE IRIS.[1]

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CONSIDERATION must first be given to the anatomy of the nerves supplying the *sphincter pupillæ* and the *dilator pupillæ*. This question was in a very unsettled state prior to the work of Langley and Anderson. These observers, in a long series of degeneration and nerve suture experiments, finally worked out the connexions. The older theories of the method of dilatation were three:

(1) Inhibition of the sphincter, allowing the elastic radial fibres to dilate the pupil.

(2) Contraction in diameter of the arterioles, following a stimulation of the sympathetic, thus emptying the iris of blood.

(3) Contraction of the radial arteries of the iris in their length.

Langley and Anderson isolated a radial strip of iris except at its ciliary attachment and stimulated the cervical sympathetic; the radial strip was shortened to half its length. Local stimulation of the periphery of the iris caused a local dilation of the pupil and cutting the sympathetic caused a lasting constriction of the pupil. Microscopic examination proved that dilatation of the pupil was wholly independent of the contraction of the blood vessels of

[1] Read at the Annual Meeting of the Eye and Ear Section of the Victorian Branch of the British Medical Association on April 25, 1922.

the iris or of the volume of blood in them. Histologically it was proved that there are radial muscle fibres in the iris. These fibres are better marked in birds than in most mammals. Thus it may be asserted that there is a muscular dilator mechanism in the iris.

Nerve Supply.

The sphincter muscle of the iris derives its nerve supply from nerve fibres from the upper portion of the nucleus of the third nerve, which lies in the ventral part of the sylvian grey matter. They travel in the nerve as far as the ciliary ganglion (lenticular ganglion). This ganglion is about the size of a pin's head and lies at the back of the orbit between the external rectus muscle and the ophthalmic nerve; it is associated with the ophthalmic division of the fifth nerve and with the lower division of the third (oculo-motor) nerve and with the sympathetic.

Thus the ganglion has three roots, *viz.*:

(1) Sensory, from the nasal branch of the ophthalmic division of the fifth.

(2) Motor, from the inferior division of the third.

(3) Sympathetic, from the cavernous plexus on the inner side of the internal carotid artery.

The branch from the third nerve, destined to supply the *sphincter pupillæ*, enters this ganglion to anastomose with its nerve cells. These nerve cells then send off numerous small nerves (the short ciliary nerves), which enter the sclera through minute apertures arranged around the optic nerve. A plexus is formed by these nerves in the peri-chorioidal lymph space and this plexus supplies the local blood vessels, the ciliary muscle (thus causing accommodation) and the *sphincter pupillæ*.

The dilator muscle of the iris derives its nerves from nuclei situated near that part of the third nerve nucleus which supplies the sphincter fibres. This must be so in order to explain the reciprocal innervation of the two antagonistic sets of muscles. Nerve fibres travel from these nuclei down the spinal cord as far as the eighth cervical and the first dorsal ventral nerve roots, with which they leave the cord. They then pass as part of the white *rami communicantes* to the superior thoracic ganglion and thence by the sympathetic chain to the superior cervical ganglion with the cells with which they anastomose. From these nerve cells the terminal nerve fibres for the dilator muscle of the iris arise and they appear to travel by two distinct routes: (*i.*) The superior cervical ganglion to the Gasserian ganglion of the fifth nerve along the nasal branch of the first division to turn off with the two long ciliary nerves to end by entering the sclera and joining the perichorioidal plexus and thence to the dilator muscle. (*ii.*) From the superior cervical ganglion grey rami are given off which travel with and form a plexus on the various branches of the internal carotid artery. One of them is the cavernous plexus which sends a fine branch to the ciliary ganglion. From here the fibres travel with the short ciliary nerves, as already indicated.

Hence it is clear that the short ciliary nerves contain pupil constrictor (third nerve) and pupil dilator (sympathetic) fibres. Electric stimulation causes both the sphincter and radial fibres to contract, but as the sphincters are the more powerful, they overcome the others and contraction of the pupil results. Cutting the sympathetic causes contraction and cutting of the third nerve produces dilatation. Stimulation of the peripheral cut ends causes the opposite effects. This course of the dilator impulses down the cord to the cervico-dorsal region explains the contraction of the pupil which is sometimes seen in injuries of the cervical spine and explains the origin of the term "cilio-spinal centre."

Sherrington has assumed that there is in the case of the limbs some system of reciprocal innervation and it is not difficult to assume the same in the case of the pupil; experimental evidence supports this. Such reciprocating mechanism must greatly increase the efficiency with which the pupil works.

The Reaction of the Pupil to Poisons.

It has been shown that certain drugs act on the neural portion of the end plate of the nerves in the iris; such drugs are physostigmine and eserine, while others, as pilocarpine and adrenalin, stimulate and atropine paralyses the muscle portion of the end plate.

Generally speaking, the poisons affecting the pupil come into three groups. Dixon classifies them as follows:

(*a*) Contractors (1) stimulating the third nerve terminals in the iris and ciliary body—pilocarpine, eserine and physostigmine, (2) stimulating the third nerve nucleus—morphine and opium.

(*b*) Dilators paralysing the terminals of the third nerve in the iris and ciliary body—atropine, homatropine, etc..

(*c*) Dilators stimulating the cervical sympathetic nerve endings in the radial muscle, causing the radial muscle to contract—cocaine and adrenalin.

Chloroform and ether cause the pupil to contract first and later, paralysing the sphincter fibres, cause the pupil to dilate. Nicotine and curare paralyse the synapses in the ciliary or the superior cervical ganglion if painted on them.

Numerous extensive researches have shown how and where these drugs act and some of them will be indicated.

The fact that atropine and eserine act fully in an eye after the division of the optic nerve, the third nerve and the sympathetic and even in an excised eye (compare experiments below) would seem to prove that the action is a local one. However, the painting of the lenticular ganglion with a solution of atropine has been shown to dilate a pupil, but the deduction that the action is central would not seem to be correct, for it would seem to be impossible in such an experiment to exclude other paths of action, as some of the drug would be rapidly absorbed into the blood or lymph circulation and thus act on the nerve endings.

Pollock has maintained that adrenalin and hypophysin act on the neuromyal junction, since deganglionation does not cause degeneration of the terminal plexus and the presumption is that both drugs act on this junction.

Atropine acts locally on nerve endings in the circular muscle, depressing them and allowing the tone of the radial muscle to overact and dilate the

pupil. A further small dilatation can be obtained by stimulating the sympathetic, which causes the radial fibres to contract actively. Excessive doses of atropine paralyse and probably kill the muscle as well as the nerve endings. Accommodation is paralysed in addition. This begins after the dilatation of the pupil and passes away before the pupil begins to contract.

Physostigmine most probably acts mainly by stimulating the nerve endings of the third nerve, though some hold that it is a direct effect on the iris muscle.

Cocaine applied locally in the conjunctival sac produces vaso-constriction, dilatation of the pupil and complete local anæsthesia. This effect is, of course, peripheral and is the result either of depressing the nerve endings of the third nerve or of stimulating the sympathetic nerve endings; the latter, Dixon holds, is more probable.

The solvent powers of the aqueous humour are known to be great and through it active agents are brought into contact with the interior of the eye. Atropine, either taken internally or dropped into the conjunctival sac, is soon found in the aqueous.

The canal of Schlemm is found to be not an uninterrupted canal, but it is divided at various places in its course into one, two or more lumina. The outer wall is dense scleral tissue; the inner wall is the meshwork of the iris angle. It is lined by endothelium, continuous with that lining the aqueous chamber. Vessels given off at intervals establish free communication with the venous system of the eye. They unite in the scleral tissue with the anterior ciliary veins. Through this canal the aqueous chamber is in communication with the general lymph system. There are no direct communications between the anterior chamber and Schlemm's canal, nor are there any lymphatics draining the anterior chamber. The aqueous passes from the anterior chamber (1) by the spaces of Fontana into the anterior ciliary veins by Schlemm's canal, (2) by the anterior surface of the iris (Osborne and others) and (3) by the ciliary body (Asayama).

Experimental.

An attempt has been made in this research to estimate the greatest dilution of atropine which will affect the iris. In the first series of experiments rabbits were used and all dissection was done in Ringer's solution at 38° C. and the same solution was used to dilute the atropine to the strengths indicated in the table. Solutions were kept at constant temperature by means of the water bath.

The local difficulty of obtaining rabbits made it necessary to abandon this animal in favour of the dog, but even with dogs the supply was very limited.

The first series of experiments (with rabbits) gave the impression that using snips of excised iris was open to objection, even though the cutting was done with extreme care. The animal having been anæsthetized and later killed, a canthotomy was done and the lids forced wide apart. With a Graefe knife the eye was sliced transversely just behind the lens. Under Ringer's solution at 38° C. the cornea was

TABLE OF EXPERIMENTS: IRIS IN RINGER'S SOLUTION.

Animal.	Number of Experiment.	Nature of Specimens.	Drug.	Dilution.	Time Taken for Reaction.	Remarks.
Rabbit	1	Snips of iris	Atropine	1 in 1,000	15 minutes	——
Rabbit	2	Snips of iris	Atropine	1 in 10,000	20 minutes	——
Rabbit	3	Snips of iris	Atropine	1 in 1,000,000	25 minutes	Iris was dead in forty minutes
Rabbit	4	Snips of iris	Atropine	1 in 1,000,000	10 minutes	——
Rabbit	5	Snips of iris	Atropine	1 in 10,000,000	10 minutes	——
Rabbit	6	Snips of iris	Atropine	1 in 1,000,000	15 minutes	——
Dog	7	Snips of iris	Atropine	1 in 10,000,000	15 minutes	Weak reaction
Dog	8	Snips of iris	Atropine	1 in 100,000,000	15 minutes	Strong reaction
Rabbit	9	Whole iris	Atropine	1 in 10,000,000	20 minutes	——
Rabbit	10	Whole iris	Atropine	1 in 100,000,000	25 minutes	——
Dog	11	Whole iris	Atropine	1 in 100,000	10 minutes	Contracted at five minutes, then dilated
Dog	12	Whole iris	Atropine	1 in 1,000,000	?	Contracted, then remained so
Dog	13	Excised eye	Atropine	——	—	Cornea and lens removed; pupil dilated after twenty-five minutes
Dog	14	Whole iris	Atropine	——	—	After twenty minutes pupil dilated; possibly œdema
Dog[1]	15	Whole iris	Atropine	1 in 10,000	15 minutes	Strong adrenalin caused contraction after forty-five minutes
Dog[1]	16	Whole iris	Adrenalin	1 in 50,000	15 minutes	Serum from blood drawn off sixteen hours previously
Dog[1]	17	Whole iris	Atropine	1 in 10,000,000	20 minutes	Slight dilatation at ten minutes
Dog[1]	18	Whole iris	Atropine	1 in 50,000,000	30 minutes	Very feeble dilatation
Dog[1]	19	Whole iris	Atropine	1 in 100,000,000	?	No measurable dilatation
Dog[1]	20	Whole iris	Eserine	1 in 100,000,000	None	No contraction in thirty-five minutes
Dog[1]	21	Whole iris	Eserine	1 in 10,000,000	25 minutes	Slight contraction
Dog[1]	22	Whole iris	Eserine	1 in 10,000,000	30 minutes	Feeble contraction
Dog[1]	23	Whole iris	Eserine	1 in 1,000,000	10 minutes	Good contraction

[1] Serum of same animal used as diluent.

sliced off and the lens removed. The iris was then either cut into radial segments or used whole and the specimens were placed in the prepared solutions, all at 38° C.. The specimens were then observed with a lens. The time at which a specimen showed definite circular puckering, is given as the time taken for reaction.

In Experiment 3 the iris was dead (*i.e.*, failed to respond to electric stimulation) in forty minutes, but it is not clear why this occurred, as ordinary tissue lives for two hours at least in Ringer's solution. A possible explanation is the extreme delicacy of the tissue of the iris.

Experiments 7 and 8 gave the reverse degree of reaction from that which might have been expected. I am forced to conclude that one specimen received a rougher handling than the other.

The whole iris experiments are more conclusive than the former series. In No. 11 the initial contraction noted was discovered to be due to mechanical causes. The mere touching with iris forceps of such a specimen in the warm solution in order to turn it over causes a momentary contraction; the removal of the lens from behind the pupil causes violent contraction. Why No. 12 remained contracted is not explained, unless it is assumed that the preparation of the specimen killed the iris outright.

In No. 13 the lens delivered itself when the cornea was sliced off; the removal of it was not intended.

The fact that Nos. 13 and 14 showed dilatation after twenty to twenty-five minutes made one question the value of the whole series and the possibility of the iris having become rapidly œdematous had to be eliminated. The difference in osmotic pressure between the Ringer solution and the cell contents in the iris would cause this œdema to occur as a result of the unbalanced action of the proteins. It should be borne in mind that all the foregoing experiments were controlled by special preparations from the same animal; in the whole iris experiments one iris was used as a control and the fellow placed in the dilutions of atropine.

In order to eliminate the occurrence of œdema, subsequent experiments were conducted with the animal's own serum as the solution in which the control specimen was observed and that to which the drug was added in the dilutions indicated. Again, this was done with all possible gentleness and at 38° C..

(1) A six months old fox terrier was anæsthetized and blood was drawn off from the carotid artery. This was centrifuged for fifteen minutes and then the serum warmed to 38° C. and placed on the water bath. The eyes were then excised and the dog killed. The preparation of the whole iris specimens was done in the serum. One iris (A) was placed in the serum and after the preliminary contraction due to manipulation had passed off, the pupil began to dilate at fifteen minutes; after twenty-five minutes it was contracting again and at thirty-five minutes was dilating again. Probably these variations were due to the fact that the specimen had to be turned over for examination, as it tended to float upside down. After thirty-five minutes it was placed in warm Ringer solution and 1 in 10,000 adrenalin chloride; after ten minutes in this solution the pupil contracted, showing that the iris was still alive.

The second iris (B) was a control in the animal's serum; it dilated slowly to a semi-dilated condition and remained so (Experiment 13).

Another similar experiment (No. 14) was done, but in this case the animal was bled twenty-four hours before, the blood allowed to clot and the serum obtained was used, together with that obtained by centrifuging after breaking up the clot. The dog was killed after excision of the eyes. The dissections were made in the animal's serum.

Iris (A) control in serum. The pupil steadied in a contracted condition after fifteen minutes and remained contracted.

Iris (B) in serum with 1 in 50,000 adrenalin chloride to stimulate dilatation. The pupil first contracted and then after fifteen minutes dilated slightly; after twenty-five minutes the dilatation was marked, though feeble.

Experiment 15 and the remainder of the series were done by first drawing off the blood and centrifuging at once in a powerful centrifuge (1,600 revolutions per minute) for twenty-five minutes. The animal still anæsthetized, the eyes were excised and dissected in the serum thus obtained. No Ringer's solution was used for dilutions, the serum being employed for this and for dissections. The strength of the atropine was decreased in consecutive experiments until at 1 in 50,000,000 the dilatation was scarcely present. At 1 in 100,000,000 there was no reaction, so it was assumed that the dilution was too high.

Assuming that eserine was less potent than atropine, the dilutions began at 1 in 100,000,000 and no reaction was obtained. The next experiment, 1 in 10,000,000, gave a slight contraction and stronger solutions gave better contractions.

The method of procedure may seem elaborate, but it was shown by the earlier experiments that many disturbing factors came in and they had to be eliminated. The result was the method last described, which worked with precision in the later experiments of the series.

The failure to trace the path of drugs instilled into the conjunctival sac from that sac to the iris has been the result of many diligent researches. There is no known colour reaction for atropine in the tissues and the most delicate test for the presence of atropine is the instillation into the eye of an animal of a solution of the suspected matter and the noting of the resulting reaction of the pupil.

Now the experiments here detailed seem to indicate that the route might be *viâ* the blood stream. Taking the total blood in the body to be between one-fifteenth and one-twentieth of the body weight, a person weighing ten stone (63.5 kilograms) would have about seven and a half pounds or 3,302 grammes of blood. Roughly these may be reckoned as cubic centimetres and it will be seen that only one minim (0.06 cubic centimetre) of 1% atropine solution would have to be added to about 5,294 cubic centimetres of blood to make a dilution of 1 in 10,000,000. Clinical evidence, however, is against the blood stream route, for a 2% solution of atropine may

be instilled into one eye twice daily for several weeks without causing the opposite pupil to dilate. Hence it is clear that the mode of conveyance of the atropine to the iris is not *viâ* the blood stream. Further, the cornea has been proved so far to be impermeable to fluids, so the actual path of absorption is still a matter for conjecture and a subject for further research, but the minimum strength of atropine, etc., which must reach the iris to effect a reaction, seems to have been determined.

Conclusions.

(1) Atropine causes a dilation of the pupil in a concentration of 1 in 50,000,000 and upwards.

(2) Eserine causes a contraction of the pupil in a concentration of 1 in 10,000,000 and upwards.

(3) Further evidence is adduced to prove that atropine and eserine, when instilled into the conjunctival sac, do not reach the iris by the blood stream.

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STOMATITIS AND GLOSSITIS IN ASSOCIATION WITH FALSE TEETH.

By MARY C. DE GARIS, M.D., B.S. (MELB.),
Melbourne.

THE causative relationship of false teeth to stomatitis and glossitis is probably not sufficiently recognized. Certainly it is only during the last three years that I have diagnosed it myself. In my view the false teeth become infected and then act as a foreign body; treatment on this assumption has proved very successful. I do not know whether the kind of vulcanite used in the dentures makes any difference, not having noted this point, though I think that the majority of my patients wore the red vulcanite.

My patients have varied in signs and symptoms. Some complain only of great dryness of the mouth, especially at night; others of sores at angles of mouth; another of a definite stomatitis with ulceration of tongue and gums; another of permanent milky patches on surface of tongue, with recurrences of superficial glossitis, so severe as to make it impossible to take solid food in sufficient quantity, with the result that gastric symptoms have supervened. Another had had a sore tongue for two years (which cleared up in a week). One instance occurred during the course of mumps. Preventive treatment should be applied to those with mumps and false teeth. Most were liable to recurrences or exacerbations.

The patients treated were greatly and quickly relieved. Instructions were given that the teeth were to be thoroughly cleansed and then soaked in mild antiseptic (generally "Listerine"). While the teeth were out the mouth was thoroughly washed out, also with a mild antiseptic. In the severer cases the teeth were left out the greater part of the twenty-four hours, but not the whole. The mouth washes were to be repeated at frequent intervals and always with the teeth out. My choice of mouth-wash varied somewhat, but usually "Listerine" well diluted did very well for the mouth and "Listerine" undiluted for the teeth.

Some recurrences have occurred among the treated cases after varying intervals, usually months.

Reports of Cases.

SUB-ACUTE NEPHRITIS AND THE RESULT OF AN EDEBOHLS'S DOUBLE DECAPSULATION OPERATION.

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SOME doubt has been thrown from time to time upon the efficacy of the operation introduced some years ago by Edebohls of splitting open the capsules of the kidneys and stripping them back. The underlying idea was that the kidney substance was œdematous and so by reason of the comparatively inelastic capsule was being subjected to considerable pressure, thus aggravating the nephritic condition by a purely physical factor. The result of these two factors would ultimately be a complete stoppage of the kidney function, with the accompanying clinical features of general anasarca, ascites and pleuritic effusion, followed shortly by death.

I have been asked to report the following case partly as an example of a case correctly diagnosed as one suitable for an Edebohls's double decapsulation operation and partly as a vindication, if such be needed, of the efficacy of the operation, not for curing the nephritic condition, for it is clearly recognized that there is in most cases permanent irrevocable damage of the kidney substance, but as a means of tiding the patient over what would otherwise be an insuperable barrier to the further prolongation of life and so giving him an avenue of escape by which an acute nephritic condition may gradually settle down into a chronic one.

History of Case.

Z.X., age 34, was admitted to the Out-Patient Department of the Melbourne Hospital on December 2, 1921. He said he had had gonorrhœa thirteen years ago and then again fourteen months ago, but gave no history of chancre. He came to the hospital on account of swelling of the lower parts of the legs, which he had noticed for the past ten weeks. This swelling practically vanished during the night, so that it was not noticeable on rising in the morning, but became marked as the day advanced. There was no history of residence in the tropics. He had never suffered from frequency of micturition and he had not observed any alteration in the quantity of urine passed. The bowels

had always been constipated, which fact he overcame by the use of pills of unknown composition.

He had been married six months and after marriage his wife was found to be suffering from syphilis, for which she was being treated elsewhere. He volunteered the information that a test performed on his blood about two months previously had not yielded a reaction.

Physical Examination.

On December 2, 1921, the patient's condition was as follows:

His pupils were equal. Both eyes reacted to light and accommodation. There was a papular rash on the chest and abdomen, which he said was always present. His heart appeared to be normal. The systolic blood pressure was 126 millimetres and the diastolic 85 millimetres Hg.. Nothing abnormal was detected in the lungs or in the abdomen.

There was œdema of the lower part of the legs, most marked on the left side. The œdema was soft and pitted on pressure and both legs were slightly tender over the œdematous portions. There was no tenderness over the femoral veins. The inguinal and femoral glands were enlarged, but not tender; he said that they had always been in that condition.

Blood taken on December 2, 1921, for a Wassermann test gave a partial positive reaction. The urine was loaded with albumin.

On December 30, 1921, after somewhat irregular attendance in the Out-Patient Department, the patient was admitted as an in-patient. The following further facts had been then elicited: During the previous few weeks he had had nocturnal frequency. During the past three days he thought he had passed a less quantity of urine than formerly. Early on the day of admission as an in-patient his face had become swollen; but when admitted this had subsided.

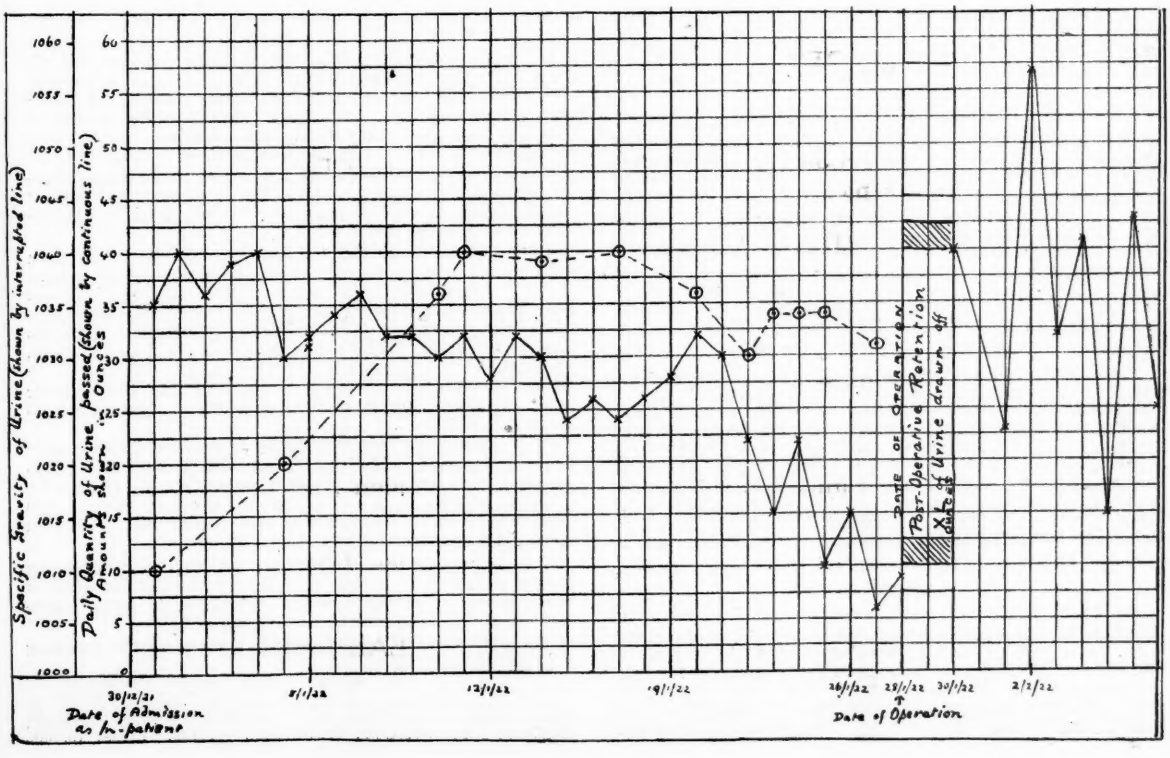
On December 30, 1921, his temperature was 37.3° C. (99.2° F.); his pulse-rate was 82 and his respiratory-rate 26. He was a pale man, slightly bloated in appearance. His pupils were equal; both reacted to light and accommodation. Pterygia were present on both conjunctivæ. Ophthalmoscopic examination revealed nothing abnormal. His teeth were in a bad condition. His tongue was coated with yellow fur. His pulse was regular, of normal rate, but its volume was small. Systolic blood pressure was 130 millimetres and diastolic 90 millimetres Hg.. The heart was normal. Examination of the lungs revealed slightly diminished breath sounds at both bases posteriorly. No adventitiæ were detected. The abdomen moved well with respiration. There was no distension, no rigidity, no points of tenderness and no shifting dulness. The liver dulness reached to the costal margin. The spleen and kidneys were not palpable. The legs were œdematous up to the knees, especially the left leg. The œdema pitted on pressure and was not painful. Enlarged inguinal glands were present as before.

Though on a very light diet—white meat, 170 grammes (six ounces), one egg, 0.56 litre (one pint) milk and water (up to one litre) per day—with daily doses of *pulvis jalapæ compositus*, 3 grammes (60 grains), and potassium citrate mixture, the œdema gradually increased until on January 11, 1922, it had extended up to the hips, the scrotum also being affected, while correspondingly the amount of urine passed each day gradually diminished. During the month prior to operation he suffered from increasing frequency of micturition, which seemed to become more marked as the urine diminished in quantity.

Urine.

In the accompanying chart I have showed the daily quantity of urine passed each twenty-four hours by a continuous line. The specific gravity, which was not recorded daily, except just prior to operation, is shown by an interrupted line. From this it can be seen that there is a gradual rise in specific gravity and a diminution in the daily quantity passed until on the day of operation there was almost a complete stoppage, not a retention, but practically an anuria.

Clinical examination at intervals showed that during the whole of the month prior to operation the urine was loaded with albumin, gradually increasing in quantity until a



few days prior to operation it showed 7% (roughly) by Esbach's method.

Microscopical examination in the early part of the month showed many crystals, chiefly phosphates, but no casts. An examination the day prior to operation showed innumerable casts, mostly granular, some red blood cells and an occasional leucocyte.

Urea Test Meal.

As a guide to the functional activity of the kidneys, judged by their capacity to excrete urea, a urea test meal was given on January 26, 1922. About one gramme (15.4 grains) of urea in one hundred cubic centimetres of water was given by mouth, the bladder being previously evacuated. Specimens of urine were then obtained one hour later (Specimen A) and two hours later (Specimen B).

The results were: Specimen A, urea concentration, 2.8%; specimen B, urea concentration, 3%; which results are within normal limits.

Blood Urea.

This test was performed with the object of confirming the suspected retention of waste products. The blood was obtained prior to the urea meal, so that no urea had been previously or recently given. Four tests were ultimately performed, the first prior to operation, just before the urea test meal; the second a few days after operation; the third about three weeks after operation and the fourth one month after discharge from hospital. The results were as follows:

Blood Taken.	Blood Urea.
January 25, 1922:	55 mgm. per 100 c.cm..
January 28, 1922:	Double decapsulation operation.
February 3, 1922:	41 mgm. per 100 c.cm..
February 24, 1922:	18 mgm. per 100 c.cm..
April 12, 1922:	14 mgm. per 100 c.cm..

It will be noticed that there is a gradual decline in blood urea as a result of the operation, so that in less than four weeks the urea content of the blood dropped to normal.

Blood Pressure.

In passing, it may be noted that the systolic blood pressure was taken at least once a week. It was found to vary between 110 millimetres and 130 millimetres Hg. and from it no information was gained.

Condition Before Operation.

The general condition of the patient was becoming gradually worse, despite practical starvation and electric baths. Routine periodical physical examination during the pre-operation month showed: (*i.*) A band of dulness and tubular breathing at both bases posteriorly, which was slowly increasing in area, though the patient had no abnormal temperature, no cough and no increase in respiratory rate. (*ii.*) Increasing œdema, which at first affected only the legs as far as the knees, but later extending above the hips and on to parts of the trunk. (*iii.*) Movable dulness in the flanks, with slight distension of the abdomen, pointing to free fluid in the peritoneal cavity.

This increasing œdema, together with the decreasing quantity of urine passed daily—diminished almost to zero—and the high blood urea content, indicating retained waste products, induced a consultation between physician and surgeon, when it was agreed that here clearly was a case suitable for an Edebohls's double decapsulation operation, the alternative being death in a short space of time. Before operation both pleural cavities were aspirated, 1.3 litres (forty-six ounces) of fluid being removed. The fluid was quite clear and light in colour. The peritoneal cavity was left untouched.

Operation.

On January 28, 1922, Mr. Alan Newton, by means of lumbar incisions, performed a double decapsulation operation. At operation both kidneys were found to be smooth, enlarged and œdematous and when the capsules were split practically along Brodel's line the cut edges of the capsules retracted back without any need for stripping. The underlying kidney surface was quite smooth and it conformed to the type expected—the large, pale, œdematous kidney of sub-acute nephritis.

After Results.

The after results were as follows:

(*i.*) Within thirty-six hours of operation 1.13 litres (forty ounces) of urine were drawn off (post-operative retention); the average daily quantity passed during the remainder of his stay in hospital was one litre (thirty-five ounces), while correspondingly the specific gravity for ten readings average 1,010.

(*ii.*) The percentage of albumin present in the urine dropped from 7% approximately to under 2% in the course of four weeks.

(*iii.*) In the same period the blood urea content dropped from 55 milligrammes per 100 cubic centimetres to 18 milligrammes per 100 cubic centimetres and a month later to 14 milligrammes per 100 cubic centimetres.

(*iv.*) The œdema immediately began to clear up, so that three weeks later there was just a slight œdema of the ankles and feet.

(*v.*) Six weeks after the operation he was discharged and walked out of the hospital and when he reported a month later he was still in the same condition.

The ultimate prognosis of the case is not good. The best that can be hoped for is that the nephritic condition becomes a chronic one.

I am indebted to Dr. R. H. Strong, Dr. S. V. Sewell and Mr. Alan Newton for permission to publish the notes of this case; to Dr. W. W. S. Johnston for his work on the urea contents of blood and urine and to those of my colleagues who shared with me the privilege of gathering the notes of this case.

Reviews.

HYPOTHETICAL THERAPEUTICS.

AFTER an interval of fifteen years Dr. Montgomerie Paton has written a second edition of his "New Serum Therapy," under the title of "Hormone Therapy by Sera, Vaccines and Drugs."[1]

Dr. Paton complains that the teaching in the medical schools for the last twenty-five years has always advocated the hypodermic or intravenous administration of antitoxins and sera by which their specific effects could be obtained and that they were not absorbed when given orally, the method which Paton prescribes.

Unless the author supports his views by stronger arguments than he does at present, there is every probability the teachers in the medical schools will remain callous-hearted and unappreciative.

It is not the first time a medical discovery has been prematurely consigned to the waste paper basket; still, the fact remains that Dr. Paton's mode of treatment has been before the medical public for many years and that his views profess to be far-reaching in their curative effects or, as they are described by his partner, Dr. Yule, revolutionary. Notwithstanding this, the methods described have been received coldly and of late years apparently forgotten, which is more significant than the most trenchant criticism.

The chapter on the "Hormone Action of Drugs" may prove of interest to the practitioner. Here he gives interesting details on the action of emetine, which, if they be verified, will prove to be very useful in therapeutics. His remarks on cantharidin should be received with a certain amount of caution and reserve.

This is not the place to discuss the merits or otherwise of the metric system, but on page 88 the author gives a prescription in grains and the directions in cubic centimetres, which is confusing and unscientific.

The publishers have to be complimented on the pleasing binding of the volume.

[1] "Hormone Therapy by Sera, Vaccines and Drugs," by D. Montgomerie Paton, L.R.C.P. *et* S. (Edin.); 1922. London: Baillière, Tindall & Cox; Crown 8vo., pp. 168. Price: 7s. 6d..

The Medical Journal of Australia

SATURDAY, JUNE 17, 1922.

The Medical Course.

THE short articles which appeared in the Education Number of THE MEDICAL JOURNAL OF AUSTRALIA of May 6, 1922, on the modified curriculum at the medical schools of our universities contain information of importance to the future of the medical profession. Two years ago a demand was made in several quarters for a reconsideration of the medical curriculum. In Great Britain leading medical educationalists, realizing that the systems in vogue were rapidly becoming ineffective on account of the transition of medicine from an empirical to an exact science, urged the authorities to relinquish the basis on which medical training had been constructed in the past and to fashion a new scheme better adapted to modern conceptions. In Australia the position was similar in every respect and the need for reform was just as urgent as in the old country. Those concerned with medical education had had their attention forcibly directed to this subject by a remarkable report by a special committee of the Edinburgh Pathological Club a year before. This report was accurately timed in that it was received by the profession at a time when everyone half recognized the need for a change. For some years sympathetic references had been made to the poor, over-taxed student, whose five years of training were becoming so crowded that his burden could scarcely be borne. It was thought that, unless some relief were afforded, the student would not be able to equip himself for the tests required for graduation. Until the whole question was carefully weighed and assessed, it was held that the remedy must be sought in a lengthening of the medical course. The learned members of the Edinburgh Pathological Club argued eloquently in favour of something more radical, something more rational than a mere extension of time to meet a difficulty which has arisen from a relatively rapid advance in medical science. Toward the end of the year 1919 this journal undertook to examine the actual requirements of medical training and to consider the means by which the difficulties might be met. The result of careful study and prolonged thought was a report which was published in the Education Number of THE MEDICAL JOURNAL OF AUSTRALIA of March 27, 1920. The proposals of the authors of this report may be summarized in three sentences. The old plan must be abandoned. The new scheme must be built on the principle that all medical knowledge is based on a special adaptation of chemistry, physics and biology to the study of health and disease. The student must be taught these applied sciences in association with the special branches of clinical medicine and pathology. It was found that the curriculum could be re-arranged to embrace adequate instruction in every branch without increasing its length. The systematic lecture, a method of teaching which cannot be adjusted to the mentality of all the students comprising a large class, was condemned in principle and restricted to a temporary minimum in practice. Underlying this plan was the principle that the aim of medical education was not to prepare students to pass examinations, but to prepare them to acquire knowledge in such a manner that after a period of five years they would be competent to continue the process of learning without the guidance of teachers and without the necessity of attending classes and clinics. The ideas were undoubtedly revolutionary. The old had been condemned, as having served its useful purpose. It had to make room for a new order of things. A new terminology was suggested, partly to emphasize the difference between what had been and what should take its place. Instead of perpetuating academic conceptions and abstract ideas, such as existed in the minds of students painfully struggling in the physiological laboratory, the fact was recorded that all medical knowledge and all knowledge concerning the relation between structure and function of the body, both in health and in disease, was either chemical or physical. Consequently, the terms medical chemistry and medical physics were to be substituted for physiology. Biology, the science appertaining to life and living things, was recognized by the admission of the term medical biology. Anatomy was relegated to a position half way between medical physics and

biology, while zoology and botany were split up into the three component sciences. To emphasize the importance of a frank recognition of this classification, it was further proposed that in each medical school there should be chairs devoted to the three essential fundamental sciences of medical chemistry, medical physics and medical biology. The occupants of these chairs should be responsible for the instruction of students in the respective sciences in their application to medical problems throughout the whole curriculum. In order to preserve the logical conception of a sound training, it was thought wise to oppose the creation of accessory chairs. Corresponding to the three great divisions of medical knowledge there should be three ultimate objectives in the scheme. The chairs of medicine, of surgery and of preventive medicine appeared to cover the requirements of an ideal scheme.

When the changes which have been introduced be examined, it will be seen that those responsible for the moulding of the course of education have been timid and fearful. Instead of admitting the inadequacy of the old order, small concessions have been made, but the essential defects have been retained. The student has been relieved of some of the useless drudgery of sleeping through dull lectures. He is given more opportunity for practical work. He is excused from a few of those senseless tests of memory, called examinations, and is required to exercise more independent thought and originality. The important basis of his knowledge is still crowded into the early years, when his ability to learn is limited. Later, when he has forgotten the greater part of the science he has been taught or that he has acquired in spite of his teachers, he is asked to apply this forgotten knowledge. The shuffling of the elementary work, the dove-tailing of the intermediate subjects and the altered allocation of time to the special subjects are unimportant, because they leave the defect in the old system untouched. In comparison with the revolutionary proposals put forward in these columns and urged in season and in vacation time (this subject is never out of season!), the patch work of the modified curriculum must appear reactionary and unwise. We would urge the Faculties of Medicine at Sydney, Melbourne and Adelaide to reconsider the whole situation. It may be difficult for experienced teachers to accept something quite new, to alter all their methods, to adapt themselves to a changed environment. But if this process be to the advantage of the profession of the future, even the conservative must surrender. Medicine is a liberal profession.

THE PATHOLOGY OF DIABETES.

THE association of *diabetes mellitus* and disorders of the pancreas has been recognized for over a third of a century. At first it was noted that a chronic pancreatitis involving the islands of Langerhans was often present in persons dead of diabetes. The significance of this relationship has been warmly disputed ever since Hirschfeld postulated pancreatitis as the primary cause of the disease. A vast amount of chemical research, an equal amount of clinical observation and much pathological study have led in the course of thirty years to the compilation of a formidable library. Notwithstanding all the printed matter the exact mechanism in the production of that symptom complex known as *diabetes mellitus* has not yet been accurately determined. It is unnecessary to trace the experimental work of Dr. F. M. Allen conducted during the past ten years, since this subject has been discussed in these columns on many occasions. He has been at great pains to prove the identity of the condition induced by the extirpation of the major part of the pancreas of a dog and diabetes in man. His doctrines of the pathology and ætiology of the disease and of its rational treatment stand or fall by the proof or disproof of this identity. In view of the extremely important nature of the subject, many of his previous articles have been subjected to a critical review in THE MEDICAL JOURNAL OF AUSTRALIA, not because of any lack of appreciation of the ingenious methods adopted by Dr. Allen, nor because of any preconceived dislike of his arguments, but because his teachings have been accepted by many with a blind faith before they have been established beyond doubt. Dr. Allen has now instituted a new magazine, called *The Journal of Metabolic Research* (published by the Physiatric Institute of Morristown, New Jersey), in which he presents a very large amount of material on the pathology of diabetes. The fact that he and his collaborators have contributed articles covering over three hundred pages of the two first numbers of the new magazine is almost unfortunate. The articles are too wordy and there is much too much thinking aloud in them. Incidentally mention may be made of the roughness of the writing and of the faulty printing which render the reading tedious and unpleasant.

In his first article Dr. F. M. Allen endeavours to establish the significance of the so-called hydropic degeneration of the islands of Langerhans in the remnants of pancreas in dogs.[1] He calls attention to the fact that Weichselbaum described this form of degeneration in 1901 in human beings and that

[1] "Hydropic Degeneration of Islands of Langerhans after Partial Pancreatectomy." *The Journal of Metabolic Research*, January, 1922.

Homans in 1912 showed that the changes were limited to cells known as beta cells. He adduces evidence to show that hydropic degeneration of the islands of Langerhans appears in the pancreatic remnant when the latter is over-strained functionally by diet capable of determining a fatal form of experimental diabetes in partially depancreatized dogs. The process developes with surprising rapidity; maximal vacuolation is noted within one month, while all or nearly all the beta cells disappear within two months. Moreover, he gives some evidence of the possibility of repair of this change, provided that it is not allowed to proceed too far before the strain on the function of the island cells is removed and before the cell membranes have given way. He publishes some excellent photomicrographs illustrating the varying degrees of hydropic change. He shows quite conclusively that, while the beta cells undergo dissolution, the alpha cells are apparently unaffected and retain their full granulation. It must be remembered that these changes are brought about by the removal of so much pancreatic tissue that hyperglycæmia, glycosuria, wasting and death occurs unless the defect in the carbo-hydrate metabolism is equalized by starvation. It would thus seem that the beta cells subserve some function in the maintenance of the sugar balance. When the pancreas is removed entirely, a profound cachexia is produced, which he regards as something quite independent of the defect in the carbo-hydrate metabolism. He therefore concludes that the alpha cells furnish an internal secretion which is essential to the welfare of the organism.. Dr. Allen claims that hydropic degeneration is definite evidence of active diabetes; that it establishes the contention that the essential changes of diabetes are to be sought in the islands of Langerhans; that the presence of hydropic degeneration in the pancreatic remnants in dogs and in the pancreas of human sufferers from diabetes proves the identity of the two conditions—human diabetes and experimental diabetes produced by the removal of the major part of the pancreas. He claims further that the degeneration explains the permanent lowering of assimilation in diabetes consequent upon excessive diets and offers evidence of an anatomical failure of cells caused by an overstimulation of tissue possessed of the power to elaborate an internal secretion. Before discussing the validity or otherwise of these important contentions, it is advisable to summarize some of the other contributions. Much must depend on the acceptability of certain assumptions underlying these contentions. These can be appreciated better when additional data have been presented.

Dr. W. B. Martin has paid special attention to the specific staining of the granules of the cells of the islands of Langerhans.[1] In the year 1900 Schultze described two forms of cells in the islands. These cells have been further studied by various observers and have been named alpha and beta cells by Lane. In 1911 Bensley suggested that a third class, less differentiated than the other two, can be recognized. It is claimed that the alpha and beta cells are independent of one another and are not transformable. In order to distinguish the characteristic granules, it is necessary to obtain the tissue in a fresh condition and to fix it in one of the reliable chromate fixatives. Dr. Martin prefers a mercuric chloride and potassium bichromate solution, either in distilled water or in dilute acetic acid (Zenker's fluid) or in alcohol and water. When the tissue fixed in this way is stained with neutral solution of ethyl violet azo-fuchsin, the zymogen appears as dense purple granules against a pink background. The chromatin of the nuclei takes the colour of the fuchsin. In the islands of Langerhans the granules of the alpha cells appear a deep violet, while those of the beta cells appear a red colour. When the staining is carried out with ethyl violet and orange G, the zymogen appears as brilliant purple granules and the nuclei a rich blue. The granules of the alpha cells are tinted yellow, while those of the beta cells have a blue or violet colour. In applying these staining methods to the pancreas of dogs rendered "diabetic" by partial excision of the organ, it was found that the beta cells became swollen during the early stage and their outlines were sharply defined. In the next stage vacuolation was seen. The cells were found to be devoid of granules; the cytoplasm was clear and contained a well-preserved nucleus. The cell outline remained sharp. Then the beta cells were seen to undergo degenerative changes. The nuclei assumed a shrunken appearance and the body of the cells began to break down. In the last stage the beta cells disappeared and the islands were seen to be composed exclusively of alpha cells. Dr. Martin points out that this final stage has not been observed in man, although the earlier stages of degeneration can be recognized in the pancreas of persons dead of diabetes. He publishes four admirably executed coloured drawings of the characteristic appearances of these stages.

Dr. F. M. Allen devotes one article to the recording of the experimental evidence to prove that vacuolation of the beta cells is not caused by the action of an increased quantity of sugar in the blood.[1] Dogs were subjected to partial pancreatectomy short of producing the condition described as experimental diabetes. When glycosuria was present, it was stopped by fasting. The diet was regulated in the subsequent periods and glucose was injected either subcutaenously or intravenously in quantities sufficient to induce a hyperglycæmia of short duration. No vacuolation was found in the beta cells. Even when the animals were rendered mildly "diabetic" in the same manner, no vacuolation appeared. On the other hand, distinct vacuolation was discovered when the dogs were rendered "diabetic," even if the glycosuria was kept in abeyance. In some of the animals the symptoms of diabetes appeared after the partial pancreatectomy and subsequent feeding on bread diet, with or without glucose. There appeared to be a tendency in these animals toward recovery, which Dr. Allen attributes to an anatomical or functional repair of the pancreatic remnant. Vacuolation has been observed under these conditions, but it disappeared as the hyperplasia or repair took place, even in spite of massive doses of glucose.

Another question of considerable importance to this aspect of diabetes is dealt with by Dr. Allen in

[1] "Granule Stains of the Islands of Langerhans of the Diabetic and Non-Diabetic Pancreas," *ibidem*, January, 1922.

[1] "The Rôle of Hyperglycæmia in the Production of Hydropic Degeneration of Islands," *ibidem*, January, 1922.

a separate chapter.[1] It has been shown by Minkowski that the dextrose-nitrogen ratio in the urine of dogs after removal of the whole pancreas is 2.8:1. Dr. Allen produces evidence to show that the dextrose-nitrogen ratio after the removal of large portions of the pancreas undergoes greater variations than does that of a dog whose pancreas has been completely removed. After partial removal the ratio may be lower than 2.8:1, but it is at times of this order, even when the remnant is extremely small or when there are prolonged symptoms of experimental diabetes. He holds, therefore, that the dextrose-nitrogen ratio cannot be regarded as a test for the determination whether or not the whole of the pancreas has been removed. It was ascertained that the dextrose-nitrogen ratio was often less than 2.8:1 after all the beta cells had disappeared, but when the ratio reached 2.8:1 in a partially depancreatized dog, the beta cells had invariably been found to be completely vacuolated or degenerated. Dr. Allen ventures to summarize the fundamental differences between animals whose pancreas has been removed and animals who have been deprived of a portion of this organ. He appears to hesitate to some extent in enunciating these claims. In the first place, he assumes that the loss of sugar and of nitrogen is greater in the former than in the latter class of animals. In the next place, he states that the total basal metabolism is probably higher after total than after partial pancreatectomy. He admits, however, that the total metabolism has not yet been measured in dogs deprived of a portion of the pancreas. In the third place, the dogs with a pancreatic remnant are in better spirits, have more muscular strength, suffer less from cachexia and prostration and live much longer than do dogs without any pancreas at all. The latter do not starve to death; they have a considerable store of nitrogenous and fatty tissue at the time of death. Normal dogs or those whose pancreas has been reduced to a mere fraction, may be made to lose even more sugar than does the dog without any pancreas; yet the former may remain in relatively good condition. He therefore concludes that the cause of death after removal of the pancreas is not dependent on the metabolic disorder, but on a definite endocrine deficiency.

Dr. F. M. Allen devotes two chapters to the evidence of the histological changes associated with diabetes in the human subject and of the significance of these changes.[2] It must be admitted that no description, even of considerable length, can convey an adequate idea of the contents of these chapters without reference to the admirable photomicrographs attached to the first article. In the first place, reference may be made to an extraordinary case to which Dr. Allen attached much importance. A patient suffered from signs and symptoms which led to the diagnosis of acute pancreatitis. An incision was made in the lumbar region on the left side and dark, necrotic material was evacuated from the pancreatic region. Later a slough of pancreatic tissue was removed through the wound and still later a second slough. The patient recovered after a time. At first his urine contained some albumin and casts and traces of glucose. The glycosuria recurred from time to time, but after indiscretions of diet the glycosuria became continuous. Death occurred two years later. The cause of death was given as uræmia, but Dr. Allen is rather inclined to believe that diabetic coma was present. Only the head of the pancreas remained. There was slight fibrosis and some fatty infiltration. The islands of Langerhans were scanty, but no vacuolation was detected. Owing to the fact that the tissue was not fresh, it was impossible to demonstrate the condition of the beta cells in the islands. It is stated that a year after the operation the condition developed into an ordinary, mild diabetes, but only scanty details of the illness are given.

Hydropic degeneration of the islands of Langerhans was discovered in the pancreas of three patients out of six. In other instances definite changes were noted, such as fibrosis, hyaline degeneration, fatty infiltration and atrophy. Dr. Allen holds that the pancreas invariably reveals signs of past inflammatory lesions and supports this claim by the records of the microscopical appearances in the six organs. He raises the question why hydropic degeneration was not found in the pancreas of patients who had had hyperglycæmia and glycosuria for several years, in view of the fact that it was present in every dog with experimental diabetes. This question becomes the more pointed since in one patient the diabetes is supposed to have resulted from a functional change in the islands, in another from the destruction of islands following an inflammatory process and in a third from a partial loss of the pancreas through sloughing. Krumbhaar has described an instance of spontaneous diabetes in a dog with definite vacuolation. It is argued that the difference cannot be between the results of surgical resection and spontaneous disease. Dr. Allen suggests that in his dogs the process is rapid and intense; all the beta cells are destroyed within two months and death occurs within three or four months. On the other hand, such rapid changes are seen but rarely in man. Ordinarily the human patient behaves more like the dog whose glycosuria is controlled by diet. Tolerance decreases but gradually and can be checked by a regulated diet. It is therefore not due to a specific pathological process, but to an overtaxed function. Unless the diabetes becomes suddenly severe and perhaps ends in coma or is fanned into activity by some intercurrent disease, the death of individual cells is likely to escape notice. He realizes that some cause must exist for the different behaviour of the islands of Langerhans in different diabetic persons. He states that the hydropic breakdown of the island cells corresponds to the rate of clinical decline. He denies that hydropic degeneration can be produced by the presence of sugar in the blood or urine. He is therefore inclined to the belief that the islands of different people vary in susceptibility and some break down more readily than others. Such individual susceptibility has not been observed in dogs.

The last point to which reference can be made at

[1] "Dextrose-Nitrogen Ratios in Partially Depancreatized Dogs," *ibidem*, January, 1922.

[2] "Microscopical Studies of the Pancreas in Clinicial Diabetes," "The Microscopic Pathology of the Pancreas in Five Hundred and Seventy Unselected Hospital Cases," *ibidem*, February, 1922.

the present time, is one which is full of pathological interest. Dr. F. M. Allen has endeavoured to apply a crucial test. He visualized a parallelism between the microscopical findings in the pancreas and the diabetic symptom complex. If his contention were correct, he would be prepared to base the diagnosis of diabetes on the microscopical appearances. To test the truth of this, he arranged to receive microscopical sections of pancreas merely bearing a number. The clinical and autopsy details were revealed after the microscopical diagnosis had been made. The number of persons who were known to have suffered from diabetes was twenty-one, while pancreas slides of 549 non-diabetic persons were also submitted. It appears that a definite diagnosis of diabetes was made five times. In one instance the condition was merely suspected, seven times it was regarded as possible or probable and twice it was held to be possible but not probable. In two instances the microscopical diagnosis was probably not diabetes, while in four the diagnosis was not diabetes. Dr. Allen regards this result as satisfactory in view of the fact that the diagnosis was attempted on the study of a few routine sections. It is possible that this explanation is valid, but the fact remains that the crucial test in so far as twenty-one diabetics are concerned failed completely to substantiate Dr. Allen's contention. It may be admitted that the failure of the test does not mean that the hypothesis set up is wrong; it is not proven.

In regard to the larger class of pancreas slides from persons said to be not diabetic, the great majority of the diagnoses were definite in excluding diabetes. In twenty-four instances confusion or possible confusion between hydropic changes and *post mortem* changes occurred. In ten a diagnosis of probable diabetes was made. One specimen from a patient who had died of enteric fever, was very interesting. The islands of Langerhans revealed much hyaline degeneration, but no hydropic degeneration. Dr. Allen maintains that hyaline degeneration of the island cells is proof positive of diabetes or a tendency in that direction. And yet this patient had no glycosuria, nor was there any sign or symptom indicating diabetes. The very feeble explanation that mild diabetes cannot be excluded begs the question, since these tests have been carried out for the purpose of producing proof of a correlation between certain histological changes in the pancreas and clinical diabetes. Similarly, the involvement of the islands in three patients with atrophic cirrhosis of the liver cannot be passed over by the assumption of an unrecognized diabetes. Dr. Allen weakens his case when he states that "the destruction of islands was never sufficient to warrant the diagnosis of diabetes," since he has emphasized that this is an essential part of the diabetic process.

There would appear to be ample evidence of the occurrence of hydropic degeneration of the island cells in human beings suffering from diabetes. A link is missing in the chain of evidence; it has not been demonstrated that the changes are confined to the so-called beta cells in the human subject. This may be regarded as a minor point and it may be conceded that by analogy it is probable that the beta cells are involved in man. It is an ingenious hypothesis that the destruction of the beta cells resulting from the after-effects of some inflammatory lesion of the pancreas determines the disturbance of metabolism and throws an undue strain on the other parenchymatous cells of the islands of Langerhans. It is an impressive state of affairs that in the dogs employed in Dr. Allen's experiments, the alpha cells have the appearance of anatomical and functional activity or even over-activity after all the beta cells have disappeared. The melting of the islands does not invalidate this hypothesis nor does it alter the fact that the alpha cells persist in the pancreatic remnant.

In the next place, the evidence in favour of the contention that in the dogs the degree of the hyperglycæmia and of the failure of the organism to break down sugar is not the cause of wasting, prostration and death is acceptable. It can scarcely be argued that the effect of a metabolic defect is the cause of the changes associated with that defect. In man diabetes is manifested by glycosuria, but the latter is not the disease. Dr. Allen has postulated a platitude, but perhaps it was worth while proving. The next step in the argument is less clear. He claims that the symptoms of his "experimental diabetes" in dogs and of diabetes in human beings are due to an over-function of the alpha cells, whose function it is to secrete an internal secretion. Even if it be admitted that the disappearance of the beta cells leads to over-action of the alpha cells and to an excessive production of an unknown hormone, there is no evidence that the symptoms of diabetes are produced in this way. Moreover, there is some speculation in this highly ingenious hypothesis. Before it could be accepted even as a working hypothesis, it would be necessary to define diabetes so clearly that an actual test could be applied to prove its existence in any given human being or in any given dog. Glycosuria can exist without diabetes; perhaps diabetes can exist without glycosuria. Diabetes is apparently a progressive condition, manifested by an essential defect in the power to metabolize sugar and by the appearance of a train of symptoms such as weakness, wasting, prostration, asthenia and the like. The tendency to coma may be an essential condition or it may be a complicating manifestation of a state of poisoning caused by the overloading of the organism with the products of incomplete carbohydrate metabolism. It must be recognized that this definition is too vague to serve the purpose of testing the truth of Dr. Allen's hypothesis. But it suggests that there is a dissimilarity as well as a likeness between the experimental condition in dogs which have been deprived of a large part of their pancreas, and diabetes of man. Moreover, Dr. Allen's contention that diabetes, save in its severest forms, can be kept in perpetual check by a greatly restricted diet does not seem to be borne out in actual practice. Dr. Allen's work has illuminated many dark passages in the pathology and pathogenesis of diabetes and it is probable that it will eventually disclose the actual nature of this highly complex and complicated affection. At present, however, we must accept some of his contentions with reserve, pending irrefutable proof. Much more work is needed before we are justified in speaking of an internal secretion of the alpha cells of the pancreas.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Superior Quadrant Hemianopsia.

MME. GOURFEIN-WELT AND REDAILLÉ (*Revue Générale d'Ophtalmologie*, August, 1921) were consulted by a woman, aged fifty-four years, for an affection of the sight following suddenly upon a short illness. Examination revealed an homonymous hemianopsia of the right upper quadrant with preservation of macular vision and some concentric contraction of the field. Two months later she had a right hemiplegia and two months after this she died. Examination of the brain showed four areas of softening in the left hemisphere, situated along the course of the posterior cerebral artery and its branches. Serial sections were made and are described from behind forwards. In the first area for some distance the occipital pole was normal, then followed a sclerosed area, which occupied the lower lip of the calcarine fissure, the lingual lobe and part of the fusiform lobule and extended forward to the cornu of Ammon. The white substance above the occipital horn of the lateral ventricle was intact. The second area partly severed the visual fibres in the posterior region of the internal capsule and the third extended into the external geniculate body. From various considerations it is obvious that the first area, which was the oldest, was the cause of the quadrant hemianopsia. The authors conclude that the lower part of the retina is represented in the inferior lip of the calcarine fissure. The persistance of vision in the horizontal and vertical meridians is regarded as supporting the theory that both occipital lobes supply the vertical meridian and that both lips of the calcarine fissure supply the horizontal meridian. The integrity of the occipital pole favours the theory that the macula is represented behind the calcarine fissure. A further conclusion is that visual fibres returning to the superior lip of the calcarine fissure pass above the occipital horn, those going to the lower lip pass below the occipital horn.

The Mode of Action of Mydriatics and Miotics.

ALTHOUGH for the quick reactions to light and accommodation the sphincter plays the most important part, CARL KOLLER (*Archives of Ophthalmology*, November, 1921) maintains that for the habitual width of the pupil the state of fullness of the vessels of the iris is the determining factor. Inflammation or congestion of the iris makes the pupil small. At death the pupil becomes wide, especially if an animal is bled to death. If methylene blue be injected into the aorta of an exsanguined rabbit, as the ears become blue, it is found that the pupils contract. Atropine, as well as paralysing the sphincter, has a constricting action on the vessels, as shown by its bleaching effect on the peri-corneal injection. Cocaine, too, has a vessel-constricting effect, well demonstrated by injecting it subconjunctivally. The vaso-constriction of cocaine is seen, too, in the widening of the palpebral fissure. Adrenalin dilates the pupil by vaso-constriction alone, shown by injecting it. Miotics, besides stimulating the sphincter, are vaso-dilators; one can directly observe this with a lens or corneal microscope. Dionin contracts the pupil by congesting the iris. In glaucoma the large pupil indicates constriction of arteries and the ciliary veins are engorged. This means that the circulation is sluggish and the increased amount of exuded fluid cannot be disposed of by the usual channels. According to the Leber-Knies theory, the iridic angle is the only exit for intraocular fluid, but it is certainly not the only way. In the healthy eye the anterior surface of the iris acts as a sponge, taking up the contents of the anterior chamber. Hence absorption from the iris surface is hastened by miotics and delayed by mydriatics.

Iritis from Focal Infection.

W. L. BENEDICT (*Archives of Ophthalmology*, November, 1921) recalls the results of some of the earlier experiments on iritis from focal disease. Rosenow injected thirty-five rabbits with organisms from patients suffering from rheumatism and obtained iritis in two rabbits. Lewis produced iritis in a rabbit by injecting a culture of *Streptococcus viridans* from a dental abscess in a patient suffering from iritis. At the Mayo Clinic cultures were made from fourteen patients (free from syphilis, gonorrhœa and tuberculosis) suffering from iritis and injected into animals. In five of the patients the iritis was acute, in nine chronic. Iritis was produced in rabbits by cultures from four of the patients with acute iritis. None was affected by cultures from those with chronic iritis. Rosenow believes there is a closer connexion between iritis and rheumatism than between iritis and other bacterial infections, arthritis and muscular rheumatism than for acute rheumatic fever. Iritis therefore is produced by bacteria arising from foci of infection (teeth roots and tonsils) and carried by the blood stream.

Trachoma of Folliculosis Among School Children.

J. A. STUCKY (*Journal of the Indiana State Medical Association*, January, 1922) refers to the interest in trachoma being aroused by the increase of this disease in the public schools. He regards it as one of the most mysterious and treacherous of diseases; he confesses that he cannot tell when trachoma is permanently cured. It is also extremely difficult to make a diagnosis in the early stages. If suspicious, the case should be treated as trachoma by the simpler remedies. Only when the diagnosis is certain should radical measures, such as grattage, be undertaken. It is often difficult or impossible to distinguish between trachoma and follicular conjunctivitis. In the latter the conjunctiva is easily and evenly put on the stretch, but where the whole body of the conjunctiva (papillary hypertrophy) is thickened, as in trachoma, the conjunctiva cannot be stretched. Pannus is invariably the result of trachoma.

Foreign Body in the Globe.

J. M. PATTON (*American Journal of Ophthalmology*, June, 1921) records the case of a young man who had a piece of steel impacted in the sclera for three months. The steel had resisted the pull of a Haab magnet. The particle was easily seen with the ophthalmoscope. As the eye was degenerating, it was decided to make a further attempt to extract the foreign body. A Knapp's knife needle was inserted and under direct observation by the ophthalmoscope was directed to the foreign body, which was thus freed from its adhesions. The particle was then drawn into the anterior chamber and removed. Haab has himself performed a similar operation.

Peripheral Iridotomy in Glaucoma.

HAROLD GIFFORD (*American Journal of Ophthalmology*, December, 1921) has tried the operation of iridotomy as described by Curran in thirty eyes of twenty-three patients suffering from quiet glaucoma. He is pleased with the operation and believes it has a future. Curran's theory is that most cases of chronic glaucoma are caused by an interference with the flow from the posterior to the anterior chamber produced by too close an application of the lens to the posterior surface of the iris. By producing a small hole in the root of the iris, he claims to have cured 94% in forty-nine eyes. A Knapp's knife needle is passed through the corneo-scleral junction; it picks up the iris and being pushed on makes a little ruck and finally a counter puncture. By cutting upwards and forwards against the back of the cornea, the little bridge of iris is cut through. It is not always possible to do this, except by a counter puncture of the cornea, which in two of the present author's cases proved disastrous. It may not always be possible to counter-puncture the iris, but even the small hole made may be sufficient. In discussing the main objections to this procedure, the author gives the following explanation as to why an ordinary iridectomy does not do all that a peripheral iridotomy can do and why the usual iridectomy so often fails in chronic glaucoma. He states that the communication between the posterior and anterior chamber made by the iridectomy is too free to produce an essential part of the effect of the iridotomy, namely, the pushing back of the iris-lens system into its proper position, thus freeing the entrance to the spaces of Fontana. This is better done by a small peripheral hole, leaving the rest of the iris intact.

LARYNGOLOGY AND OTOLOGY.

Malignant Disease of the Throat.

W. S. SYME (*The Canadian Medical Association Journal*, December, 1921) quotes Logan Turner to the effect that malignant disease affects the oro-pharynx and larynx in the proportion of five males to one female. In the hypo-pharynx the figures are reversed. The age incidence is lower with females. The symptoms vary with the site. Hoarseness, dysphagia, especially with loss of weight, pain on swallowing and cough without chest signs may occur. The naso-pharynx is the least common site. Epistaxis, nasal obstruction, deafness and severe pain are symptoms of growths here. Prompt attention is called for. For growths in the pharynx proper the suspension method for direct examination or the tube spatula is most useful. A portion of the growth should be removed for histological examination. When the growth is in the region of the cricoid cartilage an X-ray screen examination with the patient recumbent and swallowing a bismuth meal may afford valuable information. A search should be made for involved glands. If laryngectomy is to be performed, no preliminary tracheotomy is done and the larynx is removed from below upwards. If the pharynx is to be removed as well, after the division of the trachea, the œsophagus is separated posteriorally and clamped. The tube is then divided below the clamp and the lower end passed beneath the sternal part of the sterno-mastoid muscle and sutured to the edges of a button-hole in the skin. In the less radical procedures, after tracheotomy, the pharynx is packed and a long incision made along the anterior border of the sterno-mastoid. The dissection is carried down to the constrictor muscles of the pharynx and the muscles detached from the wing of the thyreoid cartilage. The sheath of the large vessels is then protected by stitching the anterior border of the sterno-mastoid to aponeurosis in front of the spine. A laryngeal or lower pharyngeal growth calls for removal of the wing of the thyreoid cartilage and a vertical incision through the constrictor muscles exposes the mucous membrane. A careful examination is now made as to the extent and relations of the growth. The pharynx is then opened by a vertical incision through uninvaded mucosa if possible; a further examination is made and the procedure adapted to the findings. An anterior flap of skin may at times be turned in to repair breaches in the pharyngeal wall. To gain access to growths in the tonsillar region or root of the tongue another incision is made from the tip of the mastoid to the chin. The triangular flap is turned down, the jaw divided in front of the masseter muscles and the two halves forcibly retracted. An alternative route to the region of the epiglottis is by the trans-hyoid incision. Diathermy has been used in operable as well as in inoperable growths, together with their glandular involvements, and gratifying results have been recorded.

Intra-Laryngeal Auto-Injector.

B. SEYMOUR JONES (*The Journal of Laryngology and Otology*, February, 1922) describes a simple device which enables a patient to inject fluids or powders into his own larynx. A U-shaped metal tube of six millimetres bore and seventy millimetres from the bend of the U to the top, has its ends bent at right angles to its arms. To one end a rubber catheter is attached and to the other a rubber ball and tube (the latter containing a valve). Near the upper end of the metal arm, to which the ball and tube is attached, is a small orifice through which the medicated oil, *e.g.*, chloretone inhalant, is introduced with a pipette. The bend of the tube is warmed by dipping it into a cup of warm water. The catheter is oiled and passed into the nostril until forty to fifty millimetres of it hang below the margin of the soft palate. About the same length of catheter remains outside the nose. The aperture in the tube is closed by the finger and during a slow, deep inspiration the patient squeezes the bulb sharply three or four times. This is done once daily. Immediately after the injection the patient should gargle with a 5% solution of bicarbonate of soda and borax in water coloured with carmine and flavoured with aniseed and peppermint. This removes the oil in the pharynx and prevents nausea. The use of this injection in tuberculous laryngitis has been found to diminish cough and expectoration, disinfect the sputum, alleviate pain and restore the patient's hopefulness.

Indications for Tonsillectomy.

SAMUEL COHEN (*Medical Record*, February 25, 1922) summarizes the indications for tonsillectomy thus: (1) Recurring attacks of tonsillitis. (2) When an attack is followed by such complications as rheumatism or heart trouble. (3) In all cases of suppurative *otitis media* lasting longer than six weeks. (4) Repeated attacks of ear-ache, when there is no local condition to explain the pain. (5) Tonsils causing difficulty in breathing. (6) Recurrent attacks of acute anterior cervical adenitis, especially when the "tonsillar gland" is involved. (7) When cheesy matter or pus can be expressed, with accompanying symptoms of toxic absorption or fœtid breath. (8) If the patient has had one attack of peri-tonsillar abscess. (9) In diphtheria carriers. Contra-indications are stated as follows: The tonsils should not be removed before the age of two unless some special indication exists, nor should they be removed in patients with arterio-sclerosis, nor in the aged. Febrile conditions and albuminuria should be allowed to subside before operation. Removal during epidemics is inadvisable and caution is needed when there are vascular anomalies in the region of the tonsils, in cases of hæmophilia, during an attack of acute tonsillitis, in any condition where an anæsthetic is dangerous and in cases of atrophic rhinitis, syphilis and diseased teeth or mouth infection.

Resection of the Nasal Septum.

O. J. NOTHENBERG (*Illinois Medical Journal*, November, 1921), in performing resection of the nasal septum, makes an anterior vertical incision from the convex side through to the muco-perichondrium of the concave side. Through this incision he elevates the tissues of the concave side beyond the limits of the deviation. Then with scissors or septum gouge he divides the bone or cartilage, with its coverings on the convex side, from the lower end of the first incision backwards below the deviation to a point posterior to it. He then elevates the soft tissues from the cartilage and bone above the deviation with a swivel knife or scissors. The deviated portion of the septum is then removed by dividing its posterior attachment with a Struycken's bone scissors or straight-edged chisel curved on the flat, or, if wholly cartilage, with the swivel knife.

The Oculo-Cardiac Reflex.

JEAN GIRON CARCASSON (*L'Oto-Rhino-Laryngologie Internationale*, April, 1921) states that the oculo-cardiac reflex evoked by pressure on the eyeballs has been found by him to stop the sneezing bouts induced by the use of the galvano-cautery or chromic acid in the nose. Hiccough, even the stubborn variety accompanying the recurrent paralysis of aortic aneurysm, as well as that of the epidemic variety, is also stopped. Tinnitus caused by blood vessels, whether of the physiological type from the carotid or that of atheroma or anæmia, can be momentarily stopped by this means. The reflex is abolished in syphilitic labyrinthitis, but in several patients with injured labyrinths and vertigo the oculo-cardiac reflexes were exaggerated. In intra-cranial complications of otitic origin the reflex was found to be inverted.

Ethmo-Sphenoidal Disease and Retro-Bulbar Neuritis.

WM. G. REEDER (*Illinois Medical Journal*, November, 1921) states that the type of nasal disease usually associated with retro-bulbar neuritis is probably the deep or destructive type or hyperplastic ethmo-sphenoidal disease. He holds that a nasal ætiology probably exists in less than 10% of patients with retro-bulbar neuritis. The most constant finding is a central circular scotoma for red and green. The eye symptoms are quite constant, whatever be the ætiology. Retro-bulbar neuritis of nasal origin usually manifests definite symptoms of nasal disease, with signs of orbital involvement and probably an enlarged blind spot. Reeder is of opinion that the surgeon is justified in advising an exploratory nasal operation in cases of obscure ætiology.

British Medical Association News.

SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held in the Lister Hall, Hindmarsh Square, Adelaide, on March 30, 1922, DR. BRONTE SMEATON, the President, in the chair.

Cranial War Wounds.

DR. JOHN CORBIN showed a patient who had suffered from an injury to the left frontal region. The patient had been wounded during the war in 1918. Since that time he had suffered from loss of memory and had complained of persistent frontal headache. A skiagram had revealed the presence of a foreign body in the right temporal region. The foreign body had been removed with good result.

Dr. Corbin also showed skiagrams of a shrapnel bullet in the lower dorsal region of the spine. Stereoscopic photographs had located the bullet immediately behind the angle of the rib and it had been successfully removed.

Ulcerative Tuberculous Vulvitis.

PROFESSOR J. B. CLELAND AND DR. D. L. BARLOW gave details of a case of ulcerative vulvitis and vaginitis occurring in a child aged eleven years. The tuberculous nature of the condition had not been revealed till the *post mortem* examination had shown advanced tuberculous lesions elsewhere. The child, who had been born in Australia, had been complaining of a sore throat for a month previous to admission to hospital. Fluids had been returned through the nose. She had complained of scalding on micturition and had lost control of the bowel. At Christmas time her hair had fallen out and she had become quite bald, except for a few short hairs. This has followed measles, apparently of the hæmorrhagic type, as the rash had been very dark. One sister suffered from fits.

She had been admitted to hospital on March 17, 1922. On examination, it had been found that the tonsils were enlarged and inflamed. There had been a purulent discharge at the back of the throat and the voice had assumed a nasal intonation. Diphtheria bacilli had not been detected in cultures. The glands in the neck had been enlarged, tender and hard and there had also been enlarged, shotty glands in the posterior triangles of the neck. Nothing unusual had been detected in the lungs, heart or abdomen. The vulva had been inflamed and tender and, on a laboratory report that gonococci had been present in a pus film taken on March 20, this inflammation and ulceration had been looked upon as of gonococcal origin. As the vaginal symptoms had appeared to be most prominent, she had been treated in a ward set apart for patients suffering from venereal disease and the question of syphilitic infection in addition had been considered. Before a Wassermann test could have been carried out, she had grown very restless and had suddenly become deaf; death had ensued on March 29.

At the *post mortem* examination, the vulva and vagina had shown extensive, ragged, in places necrotic ulceration. The abdomen had been found to contain distended coils of small intestine, ringed with massed sub-serous tubercles around central ulcers. The possibility of the vaginal ulceration being tuberculous had suggested itself and smears had been stained and examined. Large numbers of long, rather granular tubercle bacilli had been seen, some in dense masses, as well as other organims, including fusiform bacilli. In both lungs exceedingly numerous miliary tubercles were seen, of which there had seemed to be two crops, the older crop consisting of a few scattered larger tubercles and the younger of a very abundant millet-seed variety. The mesentery had contained large, caseated, tuberculous glands and the intestines typical ulcers. The glands on both sides of the neck, extending up to the tonsillar regions, had been tuberculous, in some cases breaking down. There had been an extensive, rather superficial, ragged ulceration extending round the pharynx and involving the uvula and epiglottis, but not reaching the vocal cords. The appearance of the uvula suggested that it had been nibbled at. There had been tuberculous meningitis in an early stage and in the optic thalamus a small, half-pea-sized caseated area had been discovered.

Professor Cleland stated that in this child the sequence of events appeared to have been as follows: A primary infection with tubercle bacilli, which might have been of the bovine type, had occurred some years previously, leading to involvement of the glands of the neck and in the mesentery and causing the appearance of the small tuberculoma in the brain. These more or less quiescent lesions might then have become lit up with the advent of the attack of measles. This attack had evidently been of a severe nature. A retrograde spread of the tuberculous infection had probably next taken place, leading to pharyngeal ulceration and peritoneal involvement. The tuberculous ulcers of the intestine had probably been due to ingestion of bacilli from the mouth, but might have been caused also by extension from the peritoneum. Infection of the vulva had probably been caused by tubercle bacilli in the fæces, derived from the pharynx and the bowel. It was most likely that this had been favoured by some inflammatory reaction of the part. This reaction might have been gonococcal in origin, but the organisms obtained by swabbing, though diagnosed as gonococci from their morphology and intra-cellular position, probably had not been gonococci. Finally, death had been caused by miliary tuberculosis and incipient tuberculous meningitis.

Epithelioma of a Dermoid Cyst of the Ovary.

PROFESSOR CLELAND AND DR. BARLOW also showed a large, almost solid squamous epitheliomatous mass from an ovary with a small cavity in the centre, filled with hair and sebaceous matter, representing the development of a squamous epithelioma in the wall of a common dermoid cyst. The other ovary from the same patient had shown the presence of a simple dermoid cyst.

Carcinoma of the Vulva.

PROFESSOR CLELAND AND DR. BARLOW also showed a tumour from the vulva of a child, aged six years. The tumour had been removed in Port Pirie Hospital. The growth appeared as a firm mass about $5 \times 3.7 \times 1.8$ centimetres in the subcutaneous tissue. The growth had been whitish in appearance, with some dark brown portions, apparently from blood extravasations. The tumour had consisted of moderately large cells, with large nuclei undergoing rapid mitosis, appearing as columns or masses separated by a very small amount of stroma. The growth had been considered to be either a rare form of carcinoma or a malignant melanoma in which melanotic pigment had been nearly absent.

Photographs of the Fœtus in Utero.

DR. H. C. NOTT showed three photographs of the *fœtus in utero* taken respectively at periods of five months, seven months and eight months gestation.

Operations on the Round Ligament.

DR. H. A. POWELL, C.M.G., read a paper on "Some Operations on the Round Ligament and Their Dangers" (see page 653).

DR. W. A. VERCO thanked Dr. Powell for his paper and said that, in discussing the operation on the round ligaments of the uterus, he thought it would be better to separate the different operations into the following groups:

(1) The extra-peritoneal operation: (*a*) Alexander-Adams operation, pulling up the round ligaments in the inguinal canal; (*b*) Gilliam's operation, in which the ligaments were drawn through the transverse fascia and fixed outside it; (*c*) operations with a sub-fascial attachment of the round ligaments, operations through the outer border of the rectus muscle or outside the border of the rectus muscle, (*i.*) Ritchie, (*ii.*) Cebelleros, (*iii.*) Chenhall, (*iv.*) Mayo, (*v.*) Olshausen; (*d*) through the internal ring; (*e*) through the aponeurosis near the internal ring (Crossen's operation); (*f*) Grad's sub-peritoneal shortening of the round ligaments, opening the end of the loop to the fibres at the internal ring; (*g*) Craig's operation with two incisions, the round ligaments being kept in place by a piece of the aponeurosis being slipped through the loop.

(2) The intra-peritoneal operation: (*a*) Wylie; (*b*) Mann; (*c*) Wylie-Mann; (*d*) Dudley; (*e*) Baldy-Webster;

(*f*) Bagley's modified Baldy-Webster operation; (*g*) Wardlow's operation.

The shortening of the round ligaments required a certain measure of experience to make the operation safe and satisfactory and to make the patient comfortable. In all of these operations adhesions should be first separated and inflammatory troubles treated or else the operation would fail and greater discomfort might result. In all of the extra-peritoneal operations on the round ligaments hernia might follow from weakening of the abdominal wall in the process of tunnelling or from pulling out a funnel of the parietal peritoneum with the round ligaments. Consequently, the hole should be just large enough for the particular ligament to come through. The round ligaments should not be grasped by artery clips in any of the operations, as they were apt to cut the ligament across or to interfere with its nutrition and tensile strength. In the operations at the internal ring and approximate to the internal ring care should be taken to avoid injury to the deep epigastric vessels, the iliac vessels and the genitocrural nerve. In the one case disastrous results might follow and in the other prolonged and lasting pain might supervene in the distribution of the nerve.

In his opinion, all operations at the internal ring were unsatisfactory on large sub-involuted uteri. These enlarged wombs wanted a more direct and upward pull than could be procured by shortening of the round ligaments at or near the internal ring. They were almost invariably associated with a degree of prolapse which could not be remedied at the internal ring.

Gilliam's operation and its sub-fascial modifications were preferable operative measures for enlarged, sub-involuted and prolapsed uteri. They had the disadvantage of dividing the anterior part of the pelvic cavity into three compartments, but in about 3,000 such operations he had not seen any ill-results. He thought this objection was mainly theoretical.

In Gilliam's operation and its sub-fascial modifications the round ligaments should be treated carefully in women who might be expectant mothers. If the proximal portion of the ligament were pulled up too short or too tightly in these cases, it would cause interference with the natural enlargement of the womb. The posterior wall of the uterus would hypertrophy more than the anterior and in extreme cases would cause a sacculation of the posterior wall of the uterus. This generally ended in abortion. This was especially true of the real Gilliam operation.

Again, in the real Gilliam operation the portion of the ligament on the outside of aponeurosis might slough from interference with its blood supply at the point of exit through the fascia.

He had noticed in several books the advice that the loops of the round ligaments should be sewn or fixed together by catgut after having been drawn through the layers of the abdominal wall. He thought this was bad advice and worse treatment. It nearly always resulted in pain and discomfort and did not permit enough freedom of the ligaments should a woman become pregnant.

In intra-peritoneal shortening of the round ligaments the weight of the uterus had to be borne by the attenuated portion of each ligament at and beyond the internal ring. In extra-peritoneal shortening of the round ligaments the drag of the uterus was sustained by the stout and strong proximal portion of the ligament. This was a decided advantage and in favour of the extra-peritoneal shortening.

In intra-peritoneal shortening of the round ligaments adhesions of the omentum to the plicated ligaments and their sutures were apt to supervene, more especially if chromic gut stitches were used. In fact, he thought chromic gut stitches should be avoided in these intra-peritoneal operations on account of the irritation, inflammation and adhesions which they frequently caused. In the sling operations of Baldy-Webster, Bagley and Wardlow post-operative adhesions were apt to form. Strangulated hernias through the broad ligament might occur and if there was an enlarged uterus these operations did not prevent a recurrence of the prolapse and consequently failed in a very important part of the operation.

Dr. Verco declared himself in favour of an extra-peritoneal operation, sub-fascial in the placing of the round ligaments and with a direct pull forwards and upwards where necessary, even if the anterior pelvic peritoneal cavity were divided into three compartments.

THE PRESIDENT thanked Dr. Powell on behalf of the members for his interesting paper.

DR. POWELL replied.

A MEETING of the Western Australian Branch of the British Medical Association was held at the Perth Hospital on April 19, 1922, DR. D. M. MCWHAE, C.M.G., C.B.E., the President, in the chair.

Aneurysm of the Aorta.

DR. D. S. MACKENZIE exhibited a specimen of a large aneurysm of the arch of the aorta and a smaller aneurysm of the descending aorta from the same person. This patient had been operated on by Mr. O'Hara in 1894. He had introduced silver wire into the sac and had cured the aneurysm. Some of the wire had worked out through the sac. Death had been caused by rupture of the aneurysm of the descending aorta.

Horse-Shoe Kidney.

DR. MACKENZIE also showed a a specimen of a horse-shoe kidney.

Malignant Disease of the Stomach.

DR. MACKENZIE'S third specimen was a stomach affected by malignant disease. The patient had been ill for nine months. She had been attended by a quack. A profuse hæmorrhage had occurred and death had taken place on the following day.

Reduplication of the Genital Organs.

DR. J. K. COUCH detailed the history of a patient who had been found to have a double vagina, a double cervix and a double uterus. She had been delivered of a child at King Edward Hospital without trouble. She had had three previous pregnancies and had miscarried on each occasion.

Hystero-Epilepsy.

DR. J. J. HOLLAND read the notes concerning a girl, aged seventeen and a half years, who had come under treatment on account of convulsions. She had been desperately ill for some hours. The urine had been drawn off by catheter and had been found to contain a large amount of albumin. On the following morning her urine contained no albumin.

DR. J. T. ANDERSON expressed the opinion that the condition was probably hystero-epilepsy.

Chorea in Pregnancy.

DR. A. J. NYULASY reported the case of a woman with severe chorea at the fifth month of pregnancy. He had given 0.03 gramme of morphine, but this had had no effect. Paraldehyde in doses of fifteen mils had apparently produced some effect. He had performed vaginal Cæsarean section, but the patient had died a few hours later.

Fibroid Tumours.

DR. NYULASY described the treatment by operation of an elderly woman with an extensive fibroid tumour. Rapid improvement had resulted from removal by cutting through the pedicle with scissors. In another case in which the fibroid was attached at the fundus, he stated that inversion was liable to occur. He thought that the uterine wall might be ruptured unless care were exercised in any manipulations undertaken.

Induction of Abortion for Melancholia.

DR. D. P. CLEMENT raised the question of the advisability of inducing abortion in women with mental disease and especially with melancholia.

DR. J. T. ANDERSON held that the practitioner should always be guided solely by the interests of the patient. A second opinion should be sought in every case and abortion should be carried out if both practitioners considered this course imperative.

The Wassermann Reaction as an Index of Cure.

DR. C. H. SHEARMAN read a paper entitled "The Wassermann Reaction as an Index of Cure" (see page 656).

DR. W. J. BEVERIDGE asked Dr. Shearman whether he had had any patients who had been treated carefully and thoroughly with mercury. He found that some patients could not tolerate intensive treatment with arsenical compounds.

DR. J. J. HOLLAND thought that Dr. Shearman's figures were very disturbing, as they could not assure a patient that he had been cured.

DR. W. H. NELSON referred to the finding of spirochætes in the thoracic duct after death in patients who had had recent chancre. These findings had been recorded in *The British Medical Journal*. He was in favour of combined treatment with mercury and arsenic.

DR. R. C. E. ATKINSON said that he hoped that members would appreciate the splendid work carried out by Dr. Shearman, who was one of the pioneers in Australia and one of the foremost authorities in Australia. He recommended medical practitioners to give Dr. Shearman all the help and information sought.

DR. J. K. COUCH asked Dr. Shearman to state when he would sanction the marriage of a patient who had had syphilis. He was a firm believer in mercury. He had always looked on syphilis as incurable.

DR. D. M. MCWHAE, C.M.G., C.B.E., thanked Dr. Shearman for his valuable and scientific paper. In the Australian Imperial Force they had given a course of seven injections of arseno-billon and seven injections of mercury. No further treatment was required in 70% of the patients. In 20% it had been necessary to give a second course of three injections each of mercury and of arsenic, while in 10% a third course had to be given.

In his reply, DR. SHEARMAN stated that galyl had been used in a few of the patients referred to in his paper. This was the least potent of the arseno-benzol drugs. In regard to marriage, he held that freedom from symptoms for a period of three years and an undertaking that the patient would continue to take mercury for the rest of his life were the minimum requirements before sanction could be given. He had no doubt that many patients were never cured. He held that conceptional infection was rare and occurred only when there was a focus in the testicle.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

ROSENTHAL, CECIL PHILLIP, M.B., 1916 (Univ. Sydney), Bundarra.

Special Correspondence.

LONDON LETTER.

BY OUR SPECIAL LONDON CORRESPONDENT.

Women Medical Students.

THE decision of the London Hospital to cease to accept new women students has been noticed with much interest in the lay press, in which a copious correspondence has been brought forth. In most of the provincial as well as the Scottish and Irish teaching hospitals and schools, with the exception of Edinburgh, women have been taught during the last ten or twenty years at the same lectures and clinics as men students and with a progressively diminishing amount of resentment on the part of the latter. As a rule, lecturers have not found any embarrassment in teaching mixed classes and clinical instruction of both sexes together has proved perfectly practicable.

The reasons assigned in the press by Lord Knutsford, the Chairman of the London Hospital, for the exclusion of women students are that (*i.*) a number of men students will not come to the hospital if women are taught there, (*ii.*) difficulties of discipline and organization follow the appointment of women as well as men hospital residents, (*iii.*) that a male patient suffering from venereal disease resents the presence of a medical woman and may therefore forego treatment and that there are many forms of treatment and examination that cannot be made by women doctors on men patients, although the converse, as an outcome of long standing habit and practice, takes place every day. Lord Knutsford, in an interview in *The Times* also makes a dark and unfortunate allusion to other difficulties which "lie at the very core of the whole question," but "cannot be described in plain and unequivocal terms in the columns of a newspaper." In these days of frank and plain-spoken newspaper discussions it is somewhat difficult to imagine what Lord Knutsford has in mind. Co-education is successful at Dublin, at Cardiff, at Manchester, at Leeds, at Birmingham and even at a London hospital such as Charing Cross, whose Dean stands up for the principle that in medical education and science sex does not enter at all. In this connexion Sir St. Clair Thomson has aptly cited Diderot's remark: "*Il n'y a rien de sale, ni d'impudique pour la science.*"

One reason for a man student's dislike of the coming of the woman student to his hospital is undoubtedly effective in London and could only be so in England. A large proportion of women students at a hospital school means diminished prowess on the athletic side and impaired chance of success in inter-hospital games.

However much we may be inclined to sympathize with the woman student and regret her exclusion from certain hospitals, it is only fair to remember that London has three colleges (as well as one hospital and school of 500 students) at which women only are admitted; at the same time there is no college of the London University and there are few London teaching hospitals which take men only.

With regard to the soundness of reasons assigned by the London Hospital in excluding women students there is room for speculation, but of the ultimate wisdom of the decision there can be little question. Even now the supply of medical women is beginning to exceed the demand. Many posts for women doctors have been created during the past decade in connexion with public health services, but with the present-day crying need of economy there is little tendency to extend, but rather, if anything, to curtail maternal and child-welfare services, as well as school and factory medical inspection and treatment organizations. It is such services that many women graduates have preferred and in general have been most suited to enter; at present, at any rate, the scope for women's work in general practice is very limited. Accordingly far more women are at present qualifying than are likely to find remunerative public or private work.

National Collection of Type Cultures.

I am informed that the National Collection of Type Cultures recently formed by joint action of the Medical Research Council and the governing body of the Lister Institute now numbers over 1,200 specimens. By cooperation with the British Myocological Society this herbarium is being enriched by cultures of fungi which are of importance in plant pathology, veterinary science and soil biology. The organisms are classified in strains, whose source and history are indicated in the titles. For example, the catalogue mentions four named and six others strains of *Bacillus pestis* and one amphibian, two avian, three bovine and five human strains of *Bacillus tuberculosis*. One of the objects of the collection is to undertake the supply of cultures required for experimental purposes throughout the Empire and abroad. At present about three hundred tubes are being sent out each month. Application should be made to the Curator, National Collection of Type Cultures, Lister Institute, Chelsea Gardens, London, S.W. 1, who is also prepared to give help in the identification and classification of strains received from workers abroad and would be pleased to receive from colonial sources specimens to be added to the collection.

University Intelligence.

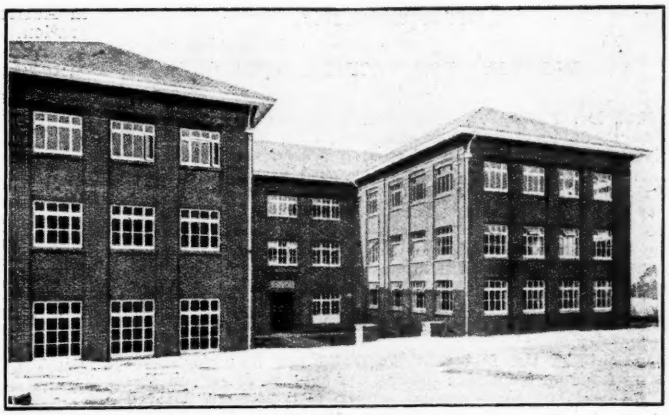
UNIVERSITY OF ADELAIDE.

THE OPENING OF THE DARLING BUILDING.

THE MEDICAL SCHOOL OF THE UNIVERSITY OF ADELAIDE has laboured under a severe disadvantage during recent years on account of the insufficient accommodation for the teaching of anatomy, physiology and pathology. In the course of forty years the school has built up a great reputation for sound education. This reputation has been maintained in spite of the relatively small sums of money spent on construction and equipment.

On May 15, 1922, the Chancellor of the University, Sir George Murray, opened a new building which will serve as the department of the fundamental sciences of the Medical School. It is a rectangular structure about 128 feet in length and 43 feet in depth, with two wings, each 54 feet by 44 feet, projecting to the north. The cost of the building itself is £25,100, while a further £12,710 had been expended on plumbing, electricity installation, refrigerating plant and joinery. The family of the late John Darling has contributed the sum of £15,000. In declaring the building open, the Chancellor gave an admirable, brief account of the development of the Medical School from the creation of a lectureship in physiology in 1882, with Dr. (later Sir Edward) Stirling as the lecturer, to the establishment of a chair of anatomy in 1884, through the period when medical students received the complete course of training up to the present extension of the school. After giving cursory details of the new accommodation provided, he stated that the medical profession had taken the liveliest interest in the Darling Building and had contributed various gifts, such as engravings, photographs, documents and instruments. He expressed the profound thanks of the University for the munificent donations which had made the erection possible. The family of the late John Darling had not only paid a filial tribute to their father, but in aiding toward the conquest of disease they had chosen a mode of preserving his memory which constituted the finest monument in the city of Adelaide.

The Darling Building is constructed of brick and comprises three stories. On the ground floor there are the histology laboratory, the library, a lecture theatre and a lecture room, common rooms for students, one for male and one for female undergraduates, the private rooms of the lecturers, a centrifuge room and an engine room. The laboratory is of ample size and has, in addition to a horse-shoe shaped bench in the centre, eight wedge-shaped tables under windows, thus providing uninterrupted daylight for six students using microscopes at each.



THE DARLING BUILDING, UNIVERSITY OF ADELAIDE: SOUTH ELEVATION.

The library is designed to accommodate the library of the South Australian Branch of the British Medical Association as well as the medical library of the University. Provision has been made for twenty-four thousand books, together with drawers for pamphlets arranged in a vertical position. The capacity of the library could be extended to take seventy thousand volumes. The lighting and general arrangements are well suited to the purpose of this department.

On the first floor there are two laboratories of the same dimensions as the histological laboratory, one for physiology and one for bio-chemistry. These are situated in the wings. In the main structure there are two small laboratories for advanced physiology and advanced bio-chemistry, a private laboratory for the Professor of Physiology and a private room. In addition, there are various good sized rooms for divers purposes.

On the second floor the wings are occupied by the zoology and the pathology laboratories, while the main building contains the laboratory for advanced pathology, the laboratory for advanced zoology, the private laboratory and room of the Professor of Pathology, a small zoological museum and a larger pathological museum.

The equipment includes a modern high-speed centrifuge machine carrying four tubes with a capacity of 250 cubic centimetres each, a good supply of microscopes and accessories, microtomes and other apparatus needed for work in histology, satisfactory apparatus for advanced bio-chemical work, including chemical balances, amino-nitrogen estimation apparatus, colorimeters, a Daniel's adiabatic calorimeter and so forth. The physiological apparatus is of first-class pattern and of sufficient quantity for the needs of the school. Hot and cold rooms are provided on each floor and a carefully worked out system of storage room has been supplied.

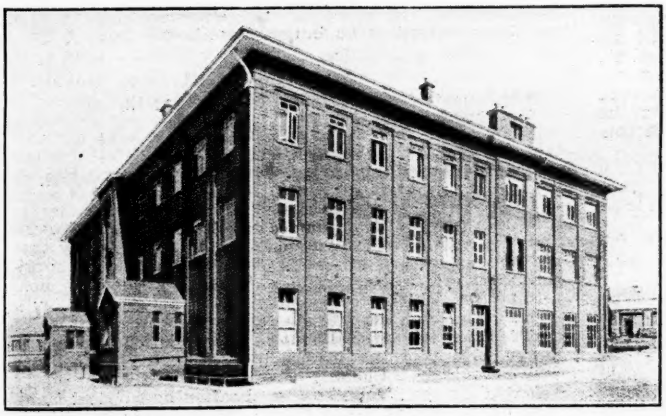
The planning of the building is the work of Mr. Walter H. Bagot, while the selection of the equipment and fittings has been carried out by Professor T. Brailsford Robertson, D.Sc..

In the entrance hall is a bronze tablet with the following inscription:

THE DARLING BUILDING.

This Building, Designed for the Use of the Medical School of the University of Adelaide, is Named in Memory of the Late John Darling, Junior, whose Family Contributed Toward its Erection.

MCMXXII..



THE DARLING BUILDING, UNIVERSITY OF ADELAIDE: NORTH AND WEST ELEVATIONS.

Correspondence.

A LABORATORY FOR TROPICAL RESEARCH.

SIR: Dr. Phillip A. Maplestone's communication (THE MEDICAL JOURNAL OF AUSTRALIA, April 29, 1922) from the Liverpool School of Tropical Medicine, suggesting that "the University of Sydney, from its geographical position, is obviously the most suitable body to control such a laboratory," is complementary to the suggestion submitted by me "that the Sydney University, for the same reason, is the most suitable centre in the Pacific for the founding of a school in tropical medicine and hygiene." Although assured that the number of cases of tropical disease which reach Sydney are few, a portion of the training for the Diploma of Tropical Hygiene could be undertaken at the University.

In spite of the fact that Australia has been fortunate in its freedom from insect-borne diseases, so often endemic in tropical and semi-tropical countries, it has not enjoyed an isolated immunity, as witness the outbreak of plague in Sydney in the early years of the present century and the more recent re-introduction thereof into Brisbane and Sydney.

In this regard, the work of the late Dr. Ashburton Thompson as Director-General of Public Health, Dr. W. G. Armstrong as Metropolitan Medical Officer of Health, Sydney, and Dr. Frank Tidswell as Director of the Micro-Biological Bureau, was recognized as being an authoritative contribution to the epidemiology of plague which stood as the guide to administrative control until confirmed and supplemented by the findings of the Indian Plague Commissions.

Drs. Cleland and Ferguson, by their subsequent work on insect-borne diseases, more especially dengue and "X" disease, have maintained the tradition of the New South Wales Health Department's Micro-Biological Laboratory, in taking advantage of whatever opportunity and time can be secured for research.

At the present time we also have at the University Professor Priestley, who carried out considerable investigational work at Townsville in association with Dr. Breinl at the Tropical Research Institute, whilst we have Professor Launcelot Harrison, an entomologist with a unique record as a successful Army sanitarian in organizing the campaign against insect-borne disease in Mesopotamia; Dr. Harvey Sutton, Lecturer in Preventive Medicine, with an enviable record for initiative and resource in the anti-malaria campaign in the notorious Jordan Valley, Palestine, and Dr. Bickerton Blackburn, who was Officer in Command of the Fourteenth Australian Hospital, Abassia, Cairo, a *rendez vous* for all sorts and conditions of tropical cases during the later stages of the Egyptian, Palestine and Sinai campaign.

As to the vulnerable position geographically of Australia to the introduction of epizootic diseases, one can emphasize the fact that to the north Java is only five days' steam from Darwin and that last month there were over 1,100 deaths from plague in that country and that even nearer we have Timor (so near as to have been the site of the last landing of the late Sir Ross Smith in his flight to Australia). From a slight acquaintance with Timor-Dielli and Batavia, one can imagine conditions as to sanitation to be even more primitive among the semi-barbaric natives in the Portuguese portions of the island there than in the congested centres of Java.

To the north-east New Caledonia, only five days from Sydney, incidentally has had plague endemic since 1900.

To the north-west Colombo, only ten days from Fremantle.

Sydney has direct communication with Singapore, the Malay States, Hong Kong, Japan, the Solomons, New Guinea and the various islands of the Pacific.

Apart, however, from the actual opportunities of seeing either tropical dieases or their sequelæ being few, there is the wider outlook of the need to equip our young graduates with the principles at least of tropical hygiene, as apart from our own mandatory territories, which should be provided with a succession of trained tropical hygienic medical experts and sanitary inspectors, the present numbers of prospective medical practitioners appear to be inversely proportional to the natural increase of population in Australia, even when augmented by prospective immigration.

With a view to catering for a possible demand, especially in the event of the Colonial Office being willing, if asked, to accept nomination from the University for appointments in the Federated Malay States, Singapore, Fiji and other colonies, hitherto supplied as to medical personnel from the homeland, a far-sighted policy, it appears to me, would be to encourage at least the experiment of inaugurating a series of special lectures on tropical hygiene and diseases. Opportunity might at least be taken whenever experts in tropical hygiene, such as Dr. Heiser, visit Sydney, to get them to impart some of their views, by inviting them to address the students at the University.

Those who guide the future destinies of a university with a phenomenal record of progress, such as Sydney, will, I trust, pardon me reminding them that it is harder to maintain than to make a reputation. The dead hand of the past at least pointed the way; it is for those who follow to adapt their courses to the varying circumstances of the present.

Certainly if Sydney does not grasp the opportunity of catering for the training of her students and graduates in tropical medicine and hygiene, she will not be true to the ideals for which others aspired in attempting to make her University the chief centre of medical teaching in the southern Pacific.

Yours, etc.,

J. S. PURDY.

Sydney (Undated).

THE TRANSMISSION OF TAPEWORMS TO MAN.

SIR: I beg leave to question the accuracy of your reply to "El Medico" in your issue of May 15, 1922. It is, of course, well known that the cysticercoid stage of many Cestodes occurs in fleas and other insects. Two tapeworms at least, which are occasionally found parasitic in man, namely, *Dipylidium caninum*, a common parasite in the dog and cat, and *Hymenolepsis diminuta*, a parasite of the rat, have fleas as their intermediate host. While it has been considered by certain authorities that an intermediate host might be dispensed with in the case of *Hymenolepis diminuta* and direct development occur, no such claim has been made in regard to the development of *Dipylidium caninum*. The cysticercoid stage of *Dipylidium caninum* occurs in the dog flea, *Ctenocephalus canis* and the human flea, *Pulex irritans*. The infection of dogs is caused by the ingestion of fleas containing these cysticercoids. The infection of humans must occur either by the ingestion of fleas containing cysticercoids or the saliva from the mouths of dogs (or cats) containing cysticercoids liberated from masticated fleas.

Surely then there is evidence of fleas acting as a vector for this tapeworm. The statement by the "vet." that fleas were carriers for tapeworms is too generalized. Cestodes which have a cysticercus stage (*e.g., Tænia echinococcus*) as opposed to those which have a cysticercoid stage, have a vertebrate animal as an intermediate host.

Yours, etc.,

CHARLES BADHAM.

Department of Microbiology, Board of Health,
Sydney, May 16, 1922.

PREVENTIVE MEDICINE IN MENTAL DISEASES.

SIR: In reply to Dr. R. A. Parker's letter in THE MEDICAL JOURNAL OF AUSTRALIA of May 27, I would like to say that my reasons for not advocating enforced sterility by surgical means are twofold: Firstly, it unfairly penalizes mental diseases, which are already overloaded (unjustly) with opprobrium; and, secondly, the presence of sterilized males and females in our community, many of them being endowed with poor intelligence but strong sexual feelings, will encourage irregular intercourse and the spread of venereal disease. Voluntary sterilization by surgical measures or the X-rays would satisfy requirements in suitable cases. Assuming that my opinions in regard to enforced sterilization are wrong, what kind of fate would a Bill to

introduce these measures meet with in a State which will not enforce vaccination against small-pox?

Every patriotic Australian will endorse Dr. Parker's remarks concerning the examination of immigrants and so would every taxpayer, patriotic or otherwise, if he knew their significance.

Yours, etc.,

W. A. T. LIND.

Kew, Victoria, May 29, 1922.

THE IMPORTANCE OF THE UTERO-SACRAL LIGAMENTS IN UTERINE PROLAPSE.

SIR: In his interesting address with the above title, published in THE MEDICAL JOURNAL OF AUSTRALIA of May 13, 1922, Dr. Thelander makes it clear that he is of the school that recognizes that the ligaments of the uterus play the primary part in maintaining that organ in the pelvis. To this extent he is a comrade in arms against the doctrine that the pelvic diaphragm holds the uterus in the pelvis and that the uterine ligaments are of almost negligible importance as supports. And, while I am quite with him in his conclusion that the utero-sacral ligaments are important structures, I find myself hardly able to accept his view that these ligaments form the most important element "which supports the vault of the vagina" and holds up the uterus. My own confession of faith in regard to the supports of the uterus appeared in *Surgery, Gynecology and Obstetrics*, July, 1920, and Dr. Thelander's address, excellent as it is, has not led me to modify those views, unless perhaps to the extent that he has succeeded in accentuating the importance of the utero-sacral ligaments.

In regard to these ligaments I will enter into no discussion of evidence, but will, as briefly as possible, state my own views of the part they play as supports of the uterus. One of the functions of the utero-sacral ligaments is to reinforce the cardinal ligaments, those well-defined fibro-muscular bands (*pars interna*) which pass outward on each side from the uterus and adjacent vaginal fornix. I regard the cardinal ligaments as the main element holding the uterus in the pelvis and, therefore, as the ligament to be primarily attacked in any rational operation for the more pronounced cases of uterine prolapse. In lesser degrees of prolapse curtailment of the utero-sacrals, with remedying of retroversion, may cure the prolapse, as Dr. Thelander points out. Here the curtailed utero-sacrals hold up the uterus and, by giving the cardinals physiological rest, encourage their contraction. I can hardly imagine, however, that this would suffice in more pronounced forms of prolapse; indeed, in many such cases the utero-sacral ligaments have absolutely disappeared. In these cases curtailment of the cardinal ligaments will certainly raise the uterus to its normal level. The supporting power of the cardinal ligaments may be shown by the simple experiment of dividing all the structures attached to the uterus except the cardinals, encircling the ligament with a blunt hook and exerting downward traction. A surprising amount of force is required to rupture the ligament.

The utero-sacral ligaments, in contracting, act as tensors of the vesico-vaginal fascia (Webster) and anterior vaginal wall; to this extent they play a part in supporting the bladder. With intra-abdominal strain in the erect posture the body of the uterus is driven down on to the bladder. As a response, the utero-sacrals tighten up the vesico-vaginal fascia and anterior vaginal wall and thus help to resist the down pressure of the uterus.

If the foregoing views of the functions of the utero-sacral ligaments be justified, no operation for uterine prolapse can be entirely satisfactory unless these over-stretched ligaments be adequately curtailed. Should these ligaments have disappeared as a result of severe prolapse, the most logical and successful method of treatment is to shorten the cardinal ligaments, as I have proved by operation in many cases.

Yours, etc.,

ARTHUR J. NYULASY.

Perth, May 20, 1922.

CRACKING OF THE SKIN OF THE THUMBS.

SIR: In reply to "Pickpocket," I would point out that if a small piece of zinc oxide adhesive plaster be cut and smeared with the least film of chloroform and applied to the splits on his thumbs he will find that the pain will be relieved in quite a few minutes and the splits healed in a very few days.

I often suffer from the same complaint myself, owing to frequent use of antiseptic lotions and can recommend the above from personal experience.

Yours, etc.,

R. C. BROWN, F.R.C.S..

"Wyuna," 116, Wellington Street,
St. Kilda, Victoria,
June 6, 1922.

Obituary.

WILLIAM COOKE FAULKNER.

THE news of the death of William Cooke Faulkner on April 20, 1922, which was recorded in our issue of May 6, 1922, caused much regret among his many friends. He met his death in a railway accident in Adelaide at the outset of a holiday trip to England.

William Cooke Faulkner was born at Folkestone, England, on February 9, 1862. He was the son of Francis Macnamara Faulkner, of Castletown, County Clare, and Emily Cooke, daughter of General Rybus Cooke, of Cheltenham. He received his early education in Cheltenham, at a school conducted by his uncle, Reverend R. H. Cooke, and later entered Malvern College. As a young man he was very desirous of joining the Royal Navy, but his ambitions in this respect were never realized, as he was rejected in the medical examination on account of his sight.

From Malvern College, William Faulkner proceeded to the University of Edinburgh in 1880 and qualified in medicine and surgery as M.B., Ch.M., in 1885, gaining the distinction of Senior Prizeman and Medallist in the theory and practice of medicine, Edinburgh Medical School.

After graduation William Faulkner spent a short period in Florida, where he had acquired some business interests, returning subsequently to England to take up practice in Pevensey. While resident in Pevensey he held the appointment of Medical Officer to the Eastbourne Union and St. John's Hospital (Almshouses). About the year 1890 he came to Australia and shortly after his arrival was married to Miss Ada Webb. He secured the appointment of resident surgeon to the Rockhampton Hospital, a position which he held for five years. At the end of this term he was influenced by health reasons to leave Queensland and take the position of medical officer to the Mount Bischoff tin mines. During the twelve years which he held this appointment he was granted a year's leave of absence, which he spent in travelling in England and the continent. He finally settled in Sunbury, Victoria, where he practised until he retired from active work some three years prior to his decease.

During the war William Cooke Faulkner held it not enough that his three elder sons should be at the front and strove earnestly to do some war work himself. Leaving his practice, he proceeded to Egypt and thence to England, in anticipation of an opportunity for transport work. After spending six weeks in England awaiting a call, he became very ill and perforce returned to Australia.

William Cooke Faulkner was versatile and erudite. His hobbies were gardening, the study of French and Italian authors, which he read in the original, and photography. The garden at his former residence in Sunbury was justly noted throughout the district. He cultivated a natural interest in laboratory and bacteriological work and kept himself well informed on all advances in this phase of medical work. He is survived by his widow, four sons and one daughter.

Proceedings of the Australian Medical Boards.

QUEENSLAND.

THE undermentioned have been registered under the provisions of *The Medical Act of 1867* as duly qualified medical practitioners:

CHENOWETH, ERNEST WESLEY, M.B., Ch.M., 1922 (Univ. Sydney), Mackay.

FARRELL, JOHN PATRICK, M.B., B.S., 1917 (Univ. Melbourne), Georgetown.

HACKETT, HENRY WILLIAM, L.R.C.P. & S. (Irel.), L.M., Wanora.

LAMB, ANDREW CECIL, M.B., Ch.M. (Univ. Sydney), Brisbane Hospital.

MURPHY, OSWALD ELLIS JOSEPH, M.B., Ch.M., 1918 (Univ. Sydney), Brisbane.

OLD, GEORGE GREENSILL, M.B., Ch.M., 1900 (Univ. Sydney), Kuridala.

OLVER, LLOYD BEATH, M.B., Ch.M., 1922 (Univ. Sydney), Toowoomba.

PORTER, EDWARD HARVEY, M.B., Ch.M., 1921 (Univ. Sydney), Brisbane Hospital.

SHANASY, JOHN ALEXANDER, M.B., B.S., 1915 (Univ. Melbourne), Charleville.

Books Received.

THE CHEMICAL EXAMINATION OF WATER, SEWAGE, FOODS AND OTHER SUBSTANCES, by J. E. Purvis, M.A., and T. R. Hodgson, M.A.; Second and Enlarged Edition; 1922. Cambridge: At the University Press; Demy 8vo., pp. 346. Price: 20s. net.

Medical Appointments.

DR. J. CATON-SHELMERDINE (B.M.A.) has been appointed a Justice of the Peace for the Northam Magisterial District, Western Australia.

* * * *

DR. B. VAN SOMEREN (B.M.A.) has been appointed Public Vaccinator at Bright, Victoria.

* * * *

DR. R. MACDONALD has been appointed Government Medical Officer at Tweed Heads, New South Wales.

* * * *

DR. N. W. HANSARD (B.M.A.) has been appointed Deputy Licensing Magistrate of the Licensing Court for the Licensing District of Rylstone, New South Wales.

* * * *

DR. M. S. PATTERSON (B.M.A.) has been appointed a Subscribers' Trustee of the Girls' Grammar School at Ipswich, Queensland.

* * * *

DR. MILDRED MOCATTA has been appointed Junior Medical Officer on probation at the Mental Hospital, Parkside, South Australia.

* * * *

THE re-appointment has been gazetted of the undermentioned gentlemen as Members of the Medical Board of South Australia: DR. A. A. LENDON (B.M.A.), DR. B. H. MORRIS (B.M.A.), DR. R. S. ROGERS (B.M.A.), DR. W. A. VERCO (B.M.A.), DR. W. T. HAYWARD, C.M.G. (B.M.A.).

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xx..

SYDNEY HOSPITAL: Honorary Aural Surgeon.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Societies Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Hampden District Hospital, Kuridala, North Queensland Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Saint George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

JUNE 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 21.—Western Australian Branch, B.M.A.: Branch.
JUNE 21.—South Sydney Medical Association, New South Wales.
JUNE 22.—Brisbane Hospital for Sick Children: Clinical Meeting.
JUNE 23.—Queensland Branch, B.M.A.: Council.
JUNE 27.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
JUNE 28.—Victorian Branch, B.M.A.: Council.
JUNE 29.—South Australian Branch, B.M.A.: Annual General Meeting.
JUNE 30.—New South Wales Branch, B.M.A.: Branch.
JULY 4.—New South Wales Branch, B.M.A.: Council (Quarterly).
JULY 5.—Victorian Branch, B.M.A.: Branch.
JULY 7.—Queensland Branch, B.M.A.: Branch.
JULY 11.—New South Wales Branch, B.M.A.: Ethics Committee.
JULY 12.—Western Australian Branch, B.M.A.: Council.
JULY 12.—Melbourne Pædiatric Society.
JULY 13.—Victorian Branch, B.M.A.: Council.

Editorial Notices.

MANUSCRIPTS forwarded the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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